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JUNE 1984

VOLUME 2
ISSUE 6

THE INDEPENDENT GUIDE FOR **APPLE** COMPUTING

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- NEW MICROSOFT PRODUCTS FOR THE MACINTOSH
- COMPLETE MACINTOSH PRODUCT CHART
- HOME REPAIR OF THE APPLE II PLUS
- INVENTORY CONTROL ON YOUR APPLE
- INTRO TO MODULA-2
- MAILING LIST MANAGEMENT
- REVIEWS: HOMEWORD BANK STREET WRITER CUT & PASTE SARGON III


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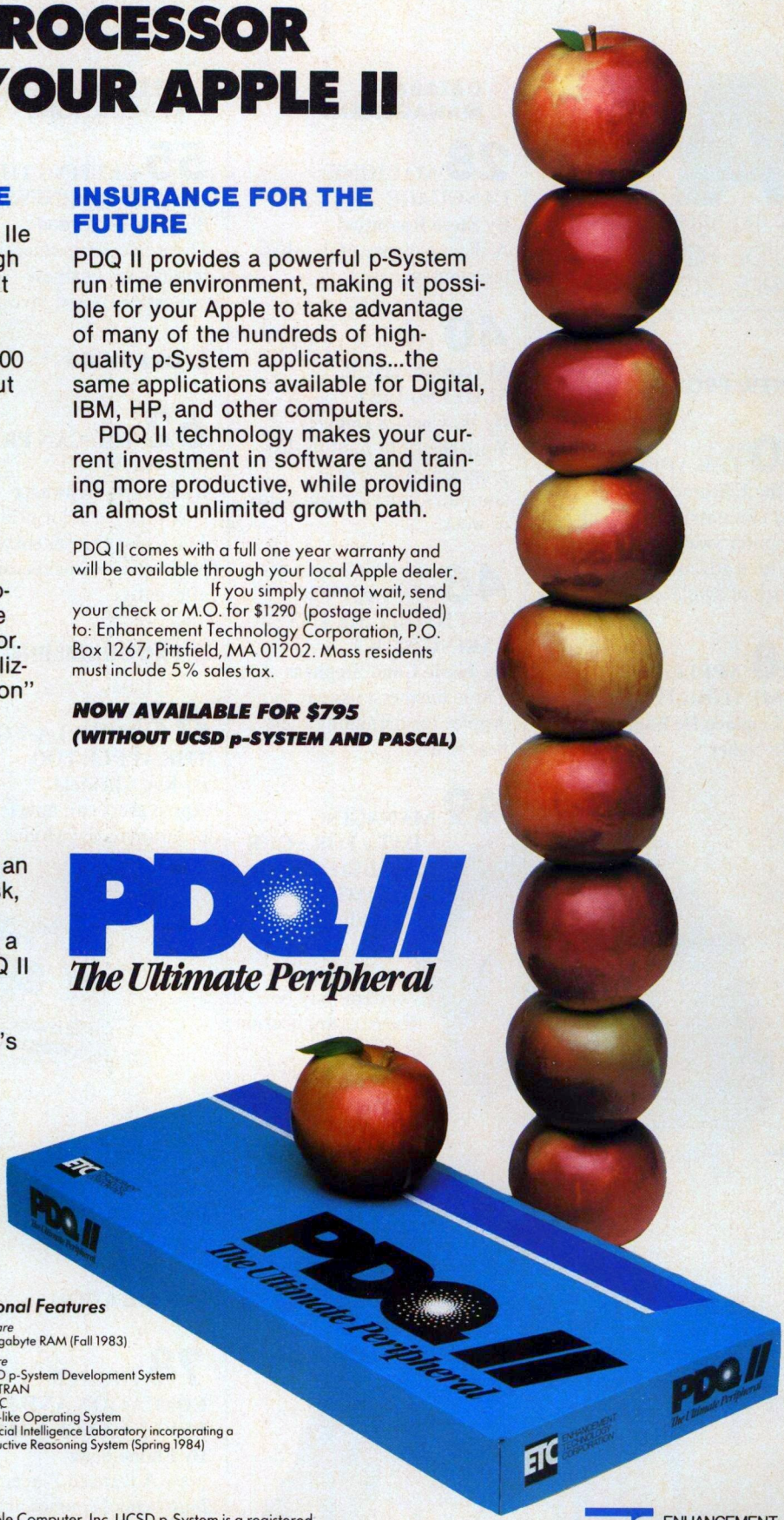


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***Optional Features***

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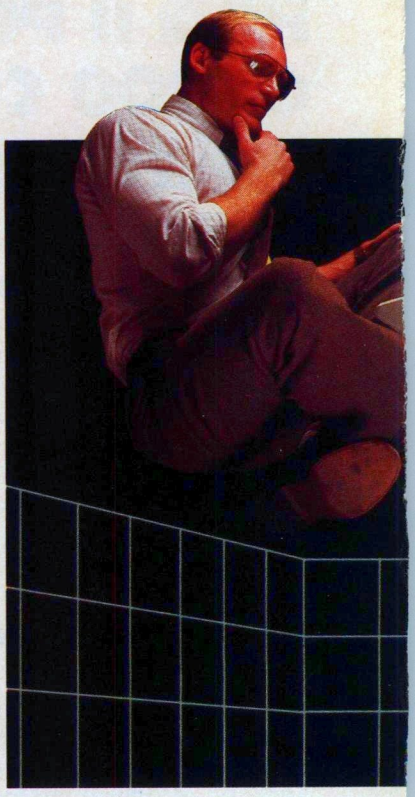

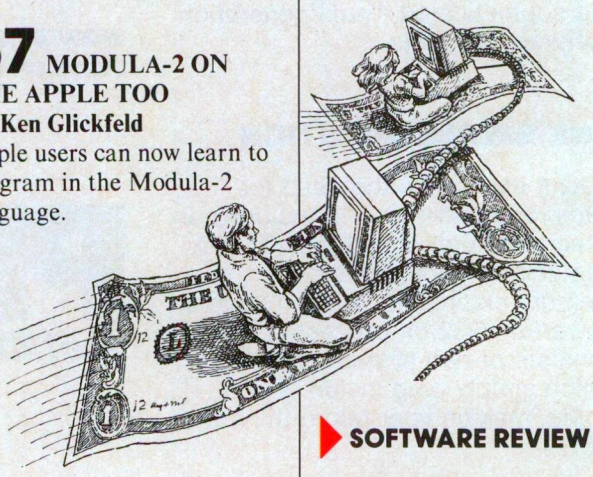

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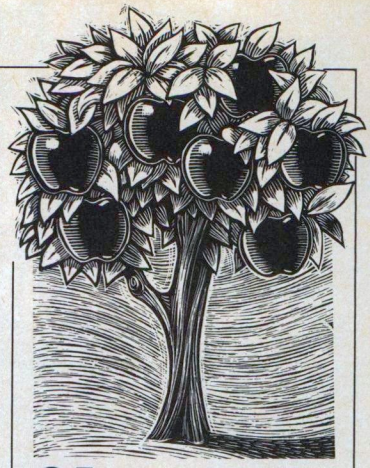

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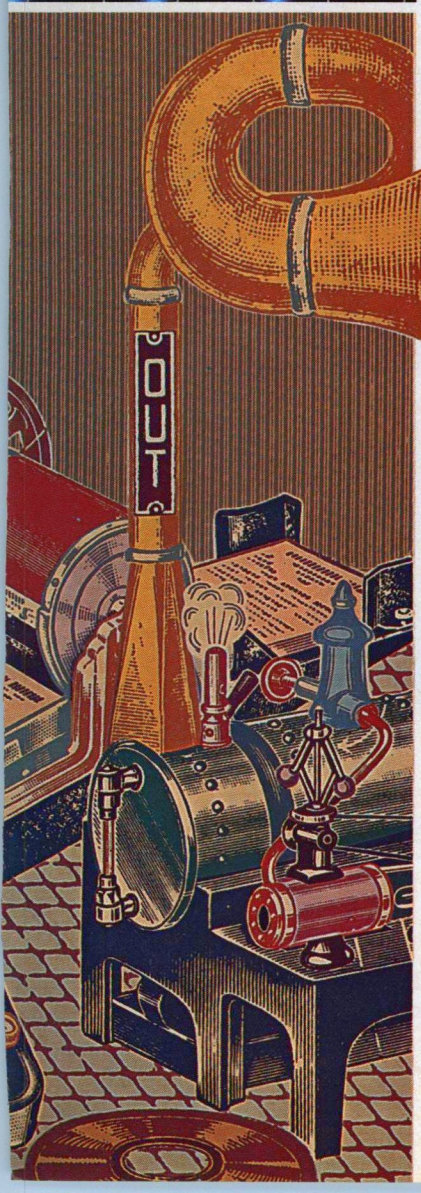

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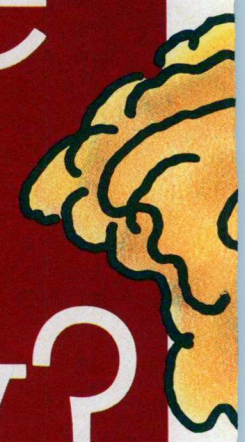
# Does your Apple leave you hungry?



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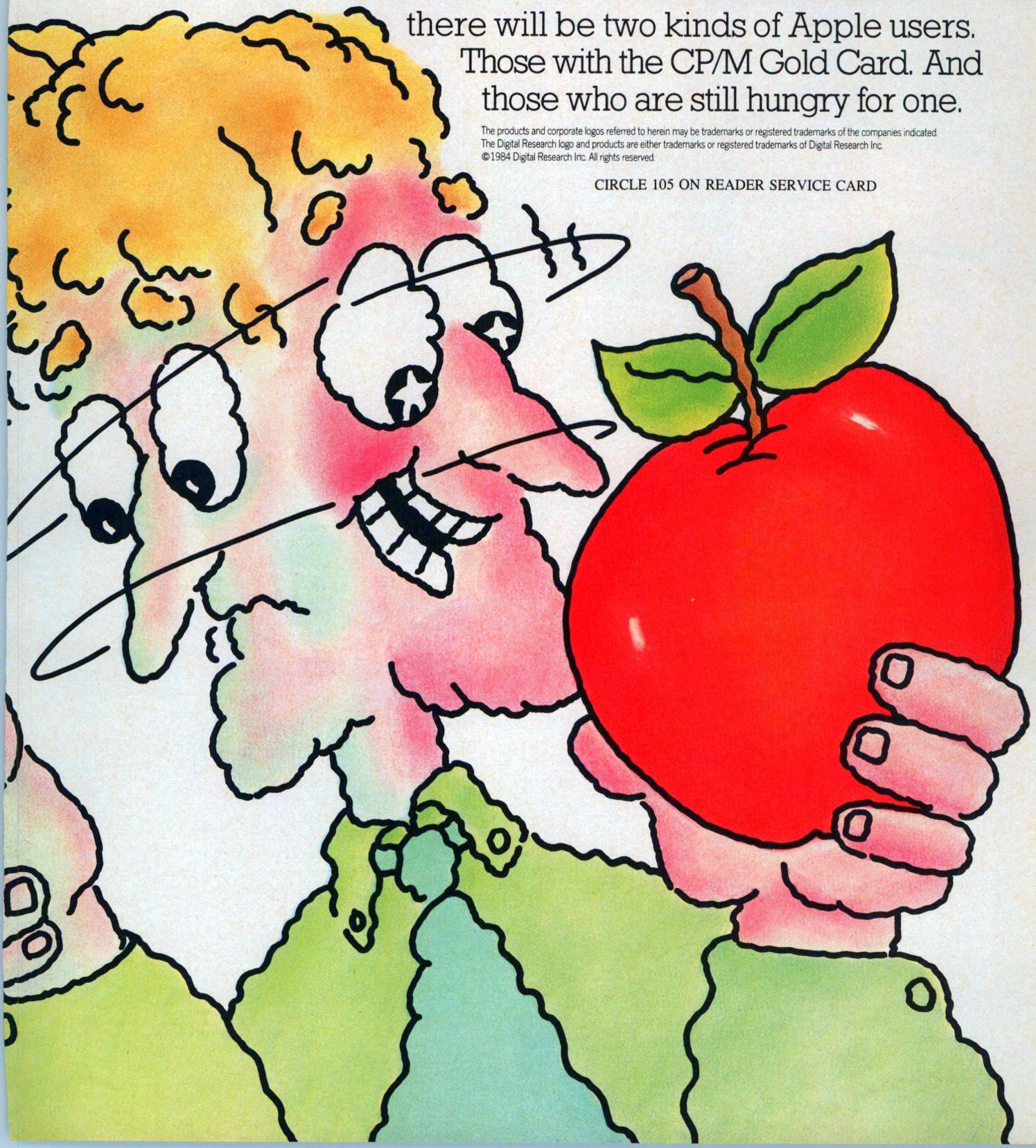

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# EDITORIAL
# A MESSAGE FROM MAGGIE

Apple Computer is on a roll—1984 is definitely going to be Apple's best year ever. The introduction of the Macintosh got the year off to an attention-grabbing start, and on April 24, Apple introduced its newest prodigy, the IIc, which is the subject of this month's cover story.

Sleek and small, the IIc is truly impressive. Weighing in at 7½ pounds, the new portable comes with a built-in 143-kilobyte disk drive, a full-size keyboard, 128K RAM, two RS-232 ports (for a modem and a printer), a mouse/joystick port, a standard video-output port, and one high-resolution-video-output port.

The new computer is set to retail for $1295. The IIc has a huge library of software ready to use, as it is compatible with most IIe software. The most significant and exciting aspect of the IIc, though, is the option of buying a 24-line-by-80-column flat-screen display. You can also buy other options, including an external disk drive; a larger terminal; a thermal printer, which works with other Apple products, too; a mouse; and various other add-ons.

We discuss all of these aspects and more in our special coverage of the IIc's introduction. We are providing a comprehensive compatibility chart, as well as articles and charts on new software and hardware being developed especially for the IIc. We will take a look at the flat screen, thermal printer, and the insides of the IIc, as well as give you a short history of the development of the new product.

After seeing the IIc, we think that Apple has a winner on its hands, and we plan to provide continued coverage of it in *A+*. Apple is aiming the IIc at the home market, in direct competition with IBM's PCjr. The company defines the home market as education, personal finance, small business, and entertainment. We also think that the IIc will gain popularity with professionals because of its portabiity and established software base.

We will cover the IIc both in the home and at the office, with special emphasis on its compatibility with the IIe. As always, we want you to participate in *A+* by writing and telling us how you are using your new Apple and giving us any suggestions and comments you have to offer.

This month's issue also includes many other useful and enlightening features. You will find several articles on how to manage information and databases. For those of you who need a lot of horsepower behind your database, we have an article on high-level database management, including coverage of 16-bit coprocessor boards. We also have articles on how to manage smaller and more common collections of data such as mailing lists.

Beginning in this issue we offer a three-part series on repairing your own II Plus. The series was originally written as a single document, so we encourage you to clip the series out and save it for reference. Although the repair guide won't help you fix everything that breaks down, it will help you determine what *isn't* wrong with your Apple.

This month we are establishing a bimonthly column on telecommunications services. More and more of you are using on-line databases, and the number and quality of information utilities is constantly increasing. Our regular contributor Russ Lockwood will keep his nose to the ground in search of new information services. Please write us and let us know of on-line databases that you think might be of interest, especially for business use.

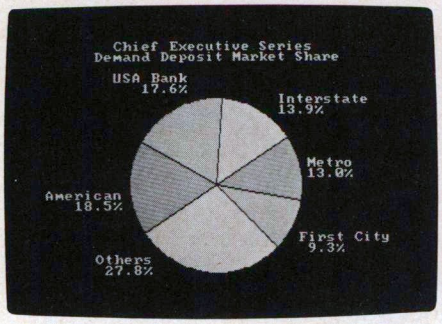
On the home front, we had John Eckhouse, technology reporter for the *San Francisco Examiner*, compare several of the leading "home" word processors, including Bank Street Writer, HomeWord, and Cut & Paste. Deciding among these products is not easy and depends on the task you have in mind, so we hope that this article will help you determine your needs.

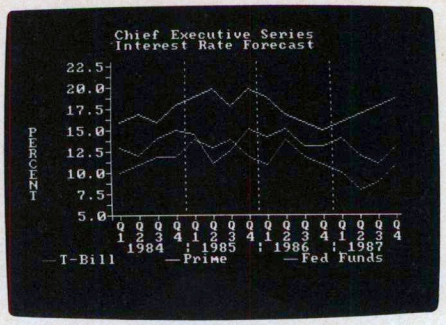
Helping you distinguish among the thousands of software packages you have to choose from—through features and software reviews—is one of our main objectives. To help you even more with your decision making, we are developing an easy-reference card to be part of our product reviews. This "Grade Card" will have categories such as documentation and ease of use in which the reviewer will assign grades from A to F. Look for the *A+* Grade Card in upcoming issues.

As we announced in our last issue, we have a new section on the Macintosh computer. This month we are covering Microsoft's new products for the Macintosh, including Word, Multiplan, Chart, and BASIC. We also have the debut of a new columnist, Dennis Brothers. Dennis developed the Macintosh terminal-emulation program we listed in our last issue, which lets your Macintosh talk with the rest of the world.

We hope you enjoy this issue, and don't forget to write to Rescue Squad for help with your Apple. If we don't answer you in the magazine, we will try to answer by letter.

Maggie Canon



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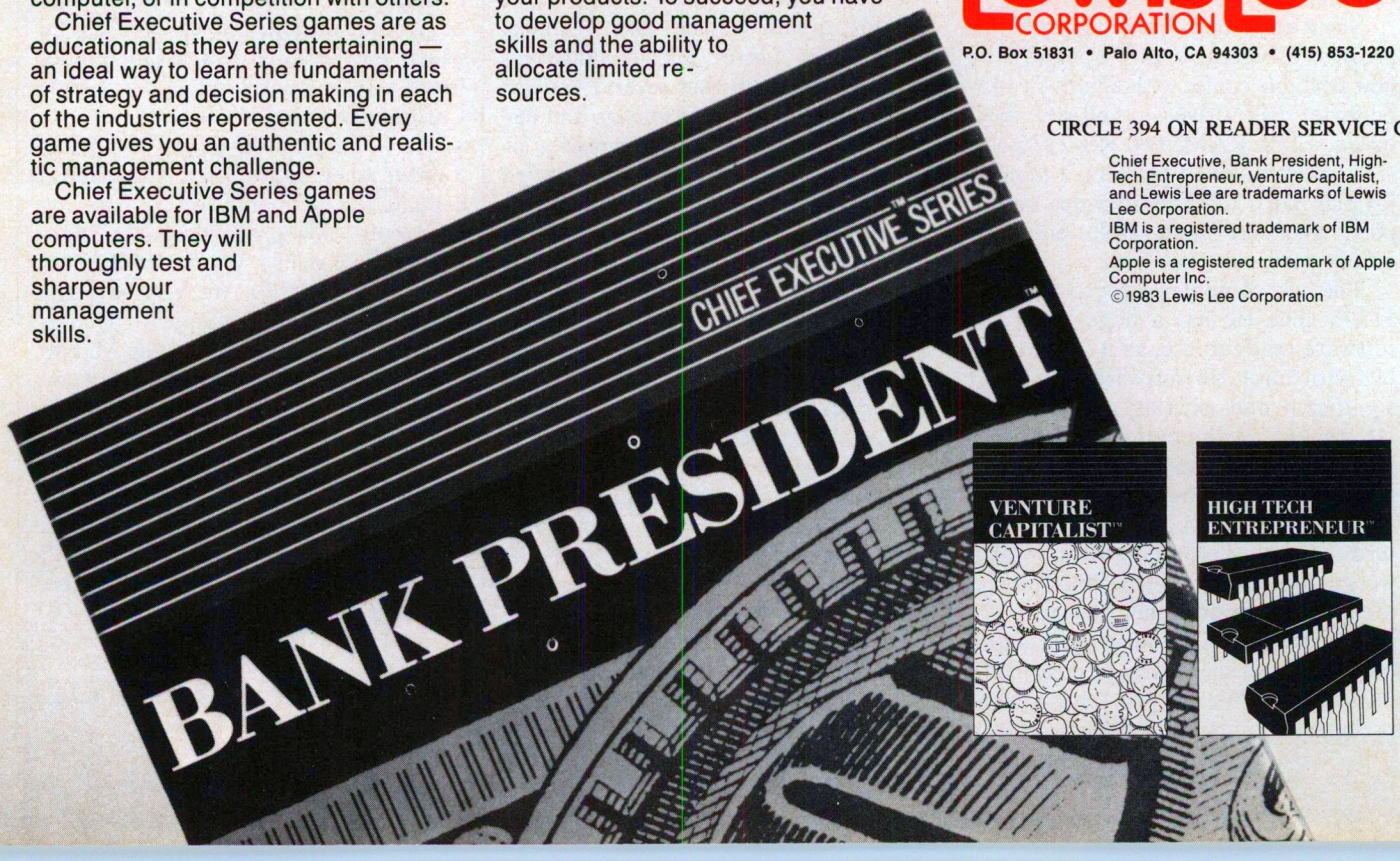
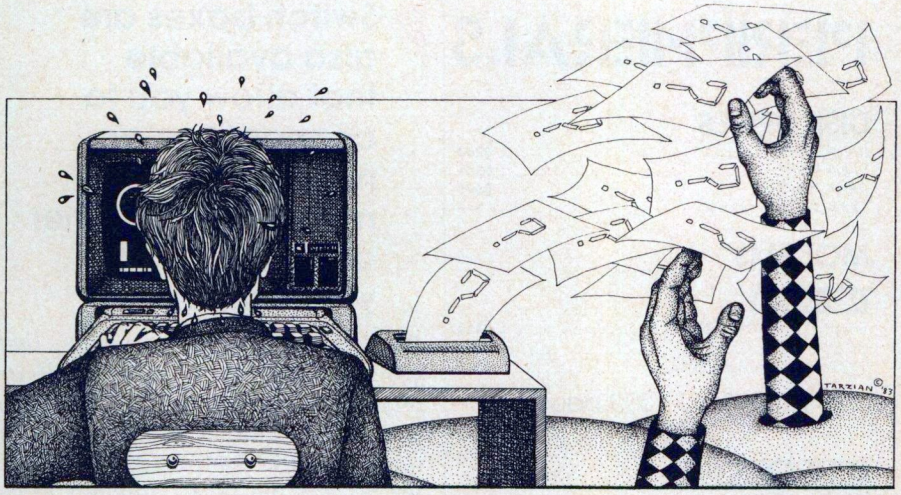


# RESCUE SQUAD/BY KEN BOOROM AND FREDERIC E. DAVIS

## Questions from our readers




**Preventing Loss of Characters**

**Q.** I have been using AppleWriter II on my Apple IIe for word processing. Every now and then I'll be typing along at a fast speed, and the computer loses some of the characters I type. This seems like a serious bug in the program. With the exception of this problem, I like Apple Writer and don't really want to learn a new program. What can I do to prevent losing characters when I'm typing?

**A.** *The reason you are losing characters when you type is that the Apple Writer program is busy updating the information in the data line at the top of the screen. The data line informs you of the remaining amount of memory, your position in the file, and other useful items. Every time you type a character, however, the data line is updated, which can overburden the computer and cause occasional characters to be lost.*

*Apple Writer has a simple built-in provision to remedy this potential problem: pressing the Escape key toggles the data line on and off. If you are typing rapidly, simply use Escape to switch off the data line display, which will keep the computer from overworking itself and losing characters that you type. If you want to see the data line, use Escape again to turn the data-line display back on.*

**Apple IIs, TVs, and VCRs**

**Q.** Is there a way to hook up my Apple II to my TV set without using an RF modulator?

**A.** *There are two ways to avoid using an RF modulator with a TV set. The easiest way is to plug the Apple's video-monitor cable (the same cable used for a regular computer monitor) directly into the Video-IN socket on your television. Only the newer TVs have a Video-IN socket, though.*

**Simply use Escape to switch off the data line display, which will keep the computer from overworking itself and losing characters.**

*A second method is to plug the computer's monitor cable into the Video-IN socket of a VCR (videocassette recorder). Even the low-cost VCRs have a Video-IN socket. To see the computer on the TV, set the recorder's VCR-TV switch to the VCR position. If you use this method, you can also record your computer display by simply inserting a videotape and pressing the record button.*

**Two Computers, One Printer**

**Q.** I want to connect my Apple IIe and an Atari 800 to an Epson FX-80 printer, so they can share the printer without my having to disconnect and change the printer cables. Manually changing the cable on the printer is inconvenient and will not be good for the connector. None of the local dealers has a piece of hardware to switch the printer. I have seen such devices in mail-order catalogs, but the prices, around $170, lead me to believe they are intended for commercial applications requiring several computers to share one printer in a local-area network.

All I need is the capability manually to select which computer will be in use at any time. Because of the expense of the devices I have seen advertised, I am reluctant to get one without knowing more. Can you provide some help with this problem?

**A.** *Printers such as the Epson FX-80 use the "parallel" protocol for connecting to the computer. Because this protocol uses many wires to make the connection, switches such as the one you want are time-consuming to make, which is the cause of their high price. The least expensive thing for you to do is use two cables. You can connect one to your Apple and the other to your Atari and then plug the other end of the appropriate cable into your Epson printer each time you want to use it. If you keep the cable's connecting pins free of abrasive dirt by cleaning them with rubbing alcohol, this action will not wear them excessively.*

*Many mail-order firms sell switch*

DONNA TARZIAN

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| KinderComp ages 3-8 | $23 |
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| Story Machine ages 5-9 | $26 |
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| Sega Star Trek | $33 |
| Sega Buck Rogers | $33 |
| Sega Congo Bongo | $33 |
| SubLogic Flight Simulator | $37 |
| InfoCom Zork 1, 2, 3 | each $26 |

## PERIPHERALS

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|---|---|
| RANA Elite 1 | $249 |
| RANA Elite 2 | $385 |
| RANA Elite 3 | $495 |
| Controller with above | $77 |

### MODEMS

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### BOARDS & BUFFERS

**PRACTICAL PERIPHERALS**

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| MicroBuffer II+ 16K | $189 |
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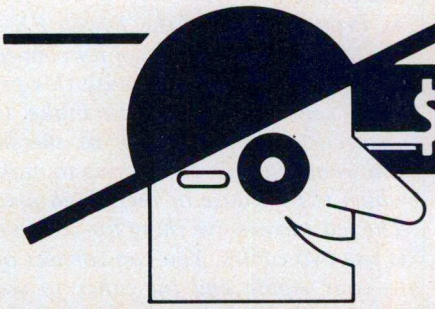

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*boxes that plug into your printer and allow you to connect two or more computers to it.*

*Switch boxes are also available that allow you to connect two or more printers, modems, and other devices to your Apple computer. These devices often cost more than $100 because the main switch is fairly expensive—it has to switch many different lines at once. Many firms carry the type of switch box you need. One of the more well-known sources that I have used is the Black Box Catalog, P.O. Box 12800,*

**Switch boxes are also available that allow you to connect two or more printers, modems, and other devices to your Apple.**

*Pittsburgh, PA 15241, a company that gives a one-year warranty on all its products. Black Box offers a switch box called "ABC-Centronics" which would be ideal for your purpose. The list price in the 1984 Catalog is $159, which is just about what you feared it might be.*

**Genealogy Software**

**Q.** Our family has an Apple IIe. We use it for business (we own some apartments), and our son plays games on it. The main purpose for buying it, though, is that I am working on genealogy, both for the family and for hire, and am up to my ears in data that I would like to get organized. Do you have information on genealogy programs?

**A.** *User Friendly Systems of Fairfield, Ohio, distributes a genealogy program that has been reduced in price from $99 to $49. Genealogical Computing Newsletter, published bimonthly, prints a directory of genealogy programs available for the Apple and other computers. Issues cost $4 each, and a one-year subscription costs $20. The addresses of these places are:*

*User Friendly Systems, Inc.*
*6135 Ross Road*
*Fairfield, OH 45014*
*(513) 874-4550*

*Genealogical Computing*
*5102 Tommeroy Drive*
*Fairfax, VA 22032*
*(703) 978-3532*

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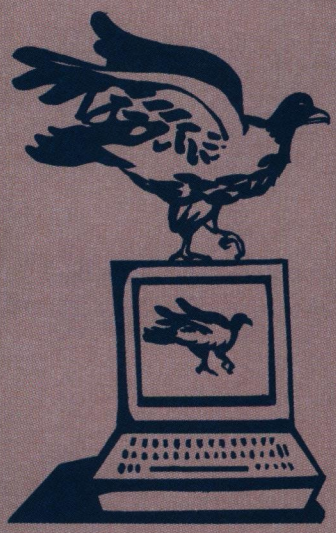
# A+ DISPATCHES

## THREE TOWERS OF THE CONDOR

In true 1984 fashion, an Apple computer is helping the government spy on a select group—Gymnogyps californianus, otherwise known as the California condor, an endangered species with an estimated population of only 30 birds.

Biologists have fitted the condors with solar-powered transmitters to obtain data on their movement and feeding patterns. Since condors may travel up to 150 miles per day, tracking them on foot or in vehicles is difficult if not impossible. The solution proved to be a series of three automated tracking towers.



The 75-foot towers, equipped with receivers, a memory board, and a modem, are for monitoring and storing data on each individual bird. Once every four to five days, biologists operating out of a field station use an Apple IIe to call up the single operational tower near Bakersfield, California, and download the data. The Apple stores the data and later plots the condors' movements on a series of maps. Periodically, the biologists transmit all data to computers at the Patuxent Wildlife Research Center in Laurel, Maryland, and the Department of the Interior in Washington, D.C.

Computer specialist Bob Munro, who coordinates computer-telemetry operations at Patuxent, notes that work is progressing on the two nonfunctioning towers.

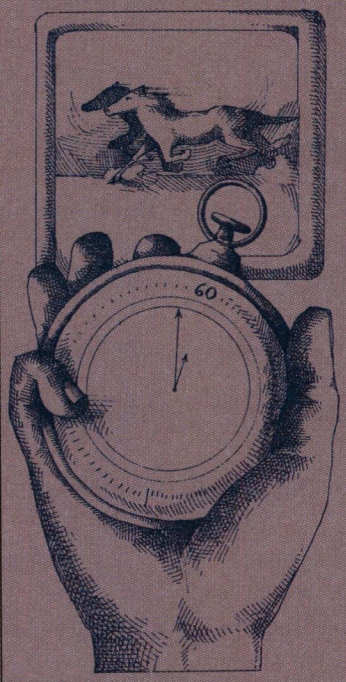
*Russ Lockwood*

## DATA AT THE RACES

Whether it's rating jockeys, reading astrological charts, or merely throwing darts at the *Racing Form*, everybody has a system for winning big at the racetrack. So it was only a matter of time until a bloodstock company merged with a computer corporation to form a firm like Post Data Services, handicappers for the Silicon Age.

This on-line counterpart to Jimmy the Greek evaluates a horse's speed, form, class, past performance, jockey and trainer, post position, and other variables to arrive at its assessment of the horse's chances. Robert Archer, PDS president, says his company's system produces a 45.5% win factor for best bets at Santa Anita Racetrack in California; competitors can muster a win factor of only 25 to 30%.

Anyone with a computer and a modem can tie into the PDS sports-information network. If horses don't arouse your gambling instincts, you can sample the morning line on football, baseball, or basketball. The Torrance, California, company also offers subscribers its own betting formula. Eventually, says Archer, PDS will provide subscribers "anything to do with betting sports"—books, tapes, films, maybe even "videos of every race run by Secretariat."



Hooking into this total sports system isn't exactly cheap: $35 per year, $5 for one day's lowdown on a particular track ($10 if you call in person rather than let your computer do the talking). But what price excitement when you can't get to the track yourself? And they're off!

*Vanessa Schnatmeier*

## NEW DISK DRIVE, OPERATING SYSTEM FOR II

The latest hardware offering from Apple Computer is a dual half-height mini-floppy disk drive for the Apple II family of computers.

Called Duodisk, the new device is smaller and costs less than two Disk II drives bought separately (the Duodisk is listed at $795; two Disk IIs cost $940).

Duodisk, which is supplied by Alps Electric, includes a new disk-eject mechanism, as well as an advanced head-positioning mechanism that permits precise reading of half-tracks.

Apple has also announced that ProDOS, the new operating system for the II, will come with every Disk II and Duodisk shipped with a controller in the U.S. and Canada. Each unit will also include the DOS 3.3 system until at least the end of this summer. Purchased separately, ProDOS has a suggested retail price of $40.

*Vanessa Schnatmeier*

## CRABAPPLE BITES BACK AT COMPUTER HYPE

We've all seen the scenario in ads on TV or in print: the young child tugging piteously on a parent's sleeve, begging for a computer. Or the slightly older child reduced to the status of disconsolate dropout because he or she didn't understand the ins and outs of programming.

Such ads severely overstate the necessity for personal-computer use, says public-relations man Steven Stroum, and may eventually turn potential buyers *away* from computers. That's why he's formed the Crabapple Anti-Computer club.

"I felt advertisers were

hitting below the belt," said Stroum. The companies pitching computers for toddlers particularly disturbed him: "Toddlers need to socialize; they don't need to interact with computers. Psychologists have proved that repeatedly."

Stroum contends that the home-computer market does not exist, at least not as the glowing vision computer ads paint. He quotes Roy Amara of the Institute for the Future, saying that as people realize computers are no panacea, computers will be in no more than 25% of households by 1990.

He hopes the Crabapple Anti-Computer Club will foster "a greater awareness of the social impact of computerization and function as a counterbalance" to the hype that surrounds computers now. The name "Crabapple" was chosen not because of any grudge against Apple Computer, he said, but because "it's an interesting, sour little fruit," and it gave him a catchy handle for his cause.

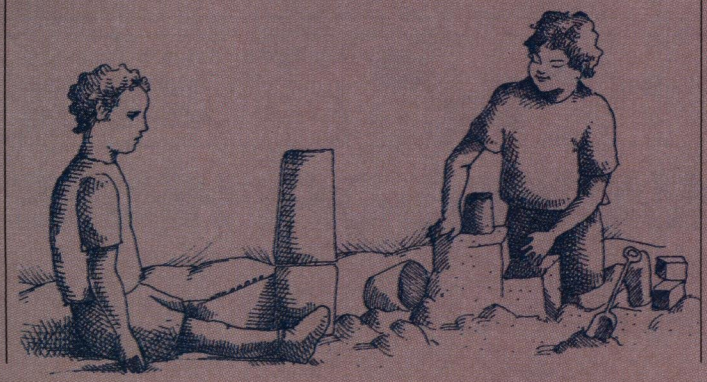
With the $19 annual fee from members, Stroum plans to publish a bimonthly newsletter containing relevant articles from the public and trade press, as well as contributions from group members.

Stroum said his chief concern is about people striving for upward mobility and about their children, who might take out a large loan for a computer they and their children will rarely use.

"I'm tech-oriented; I write copy for tech companies. But if the hard pitch and the hard sell continue, people are going to become disillusioned. I don't believe computers are a fad, but I don't believe computers are for everybody."

For further information, contact Stroum at Crabapple, Inc., P.O. Box 3236, Framingham, MA 01701.

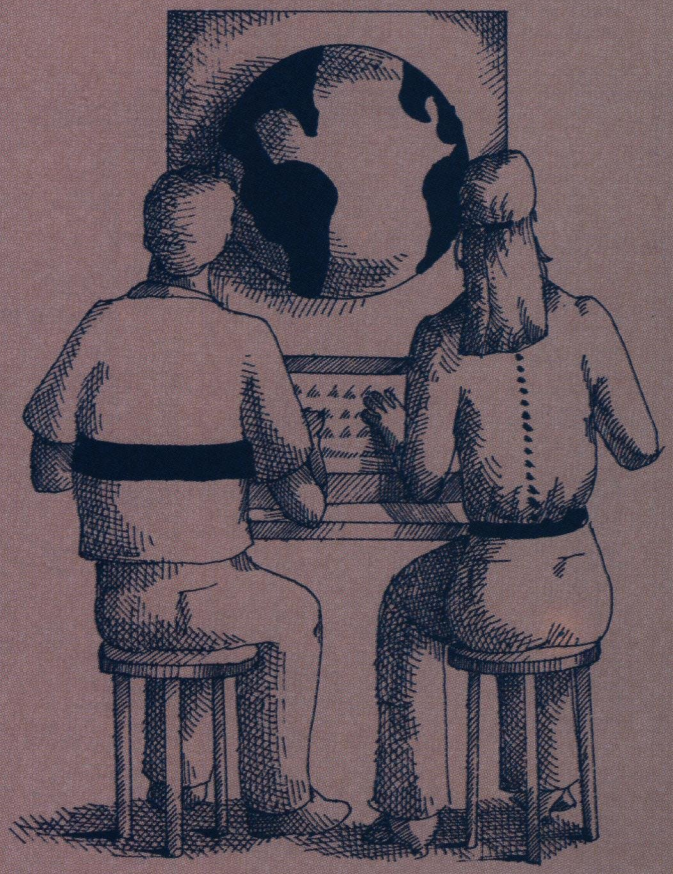
*Vanessa Schnatmeier*



## THE *NEW* SOCIAL STUDIES

The earth explodes. A reporter sneaks onto the Caribbean island of Grenada. Trash lies strewn about the landscape. The president is impeached, and the mayor is recalled. And the Russians aren't very happy with those ICBMs.

Those were some of the scenes lurking in computer programs written for a student-software exposition at the recent Computer Festival '84 in Santa Cruz, California.



Jacquy Griffith, computer-programming teacher at the local Harbor High School, directed her students to write programs that nonviolently dealt with social issues. Students responded with programs entitled World War III, Pollution, Trash, A Trip out of This World, and Grenada. Others stuck a bit closer to home and crafted software on such topics as budgeting one's money in hard times, or on life in high school. (That last game, complete with monsters, was modeled on a popular Dungeons-and-Dragons-style program.)

The students found solutions to knotty social problems besides total thermonuclear war, of course. Griffith sees computers as an excellent way to help students investigate the world. Says she, "Through computers students can get a handle on understanding complex social, biological, and economic systems." Current educational computer games are "just the tip of the iceberg."

These programs were the fruit of only one semester, in which the students selected their own topics. This semester, Griffith has added a new twist. She has invited local nonprofit organizations to contribute ideas for the social-issue projects, including the groups' real-life programming needs.

*Vanessa Schnatmeier*

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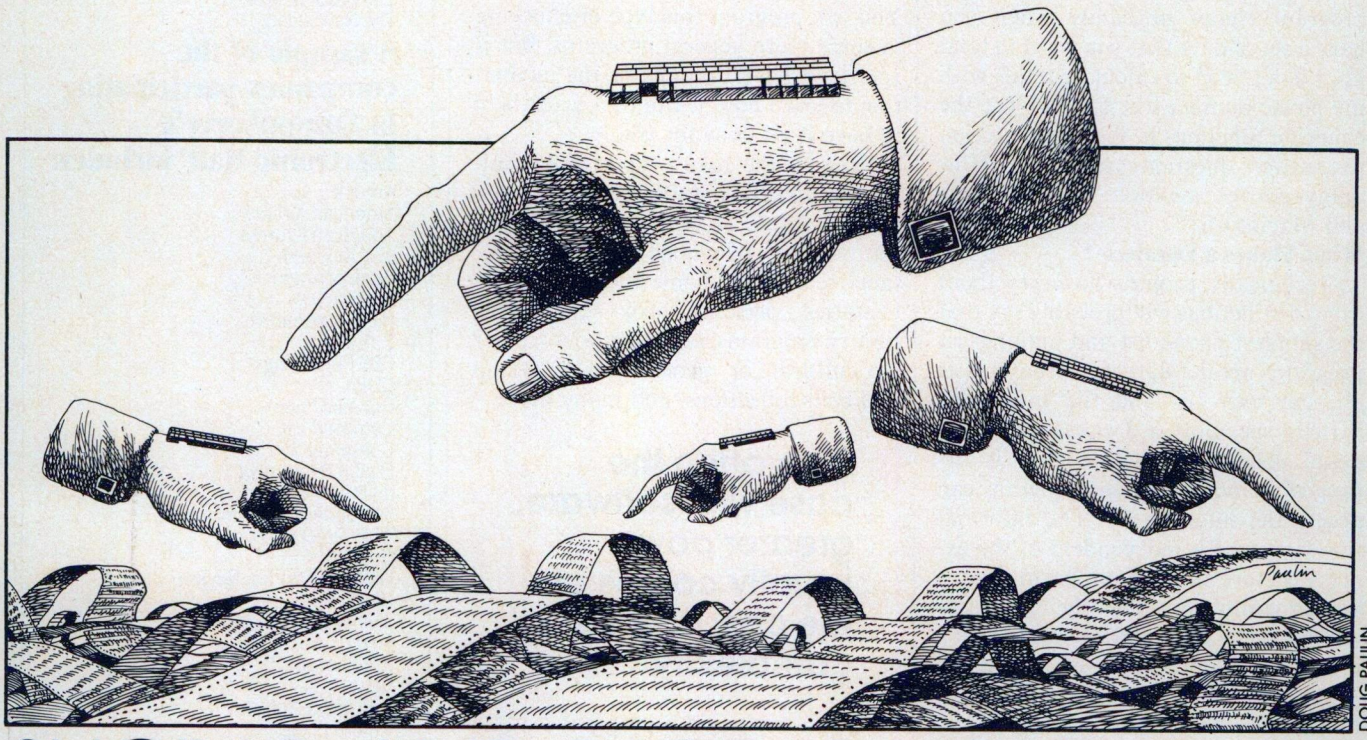


DOUG PAULIN

# SLICING AND DICING YOUR DATA

If *database* seems to you to be just a fancy name for a long list, you either haven't had a chance to work with these programs, or you're living an admirably simple life. Database programs let you use a computer to store, rearrange, and report on information in ways that would often be too time-consuming to do by hand.

You can run a simple database on most any computer, but more advanced programs require more powerful hardware. Until recently, database programs for the Apple emphasized ease of use rather than high capacity or speed, mostly because disk storage was limited. But with ProDOS for the II family and optional hard disks for the Macintosh and the Lisa, you should be able to turn to these machines for demanding uses.

Fortunately, though, not every application requires megabytes of storage. If you need formatted output or information sorted in more than one order, you may want to turn to your Apple to work with a list as small as a few dozen items. If you can do some work, make phone calls, or clear your desk while you're waiting, even the slower speed of a floppy-based system should not be too much of a problem, even when you have hundreds of entries.

**You can run a simple database on most any computer.**

The easiest example of the kind of file you might put on a database is your telephone list. If all you want to do is look for names in alphabetical order and find phone numbers, using a computer may not be worth the trouble. In fact, when the amount of information is relatively small and all you want to do is retrieve it, you may be better off with a set of three-by-five cards. That's how I keep my list of phone numbers of my personal friends.

Databases become worthwhile when you want to look at the same information in several different ways. For example, I have a list of computer-industry business contacts on my computer. If I want a simple telephone list in alphabetical order, I can get that, but if I want a list of everybody on the list arranged in phone-number order so I can check my phone bill, I issue a few commands to have that printed out. If I want the list arranged by date of entry, I can get that too.

Another reason for turning to a database is to be able to select subsets from a larger listing. On my business-contact lists, I sometimes select all the people who are involved with Apple computers or all the people in area code 415.

Yet another reason for using a database program is to use built-in output formatting. If I ever want to send a mailing to my contact list, I'll want the names and addresses arranged as labels, but on the list I use every day, I want standard 8½ × 11-inch sheets. With a database program, setting up such simple formats is easy.

The report-generator sections of many of the more advanced database programs also include arithmetic functions and logical tests, so a database program comes in handy when you have a set of data that you want to total up. I don't need to calculate totals with my phone number list, but I do use the counting functions in the report section to answer questions such as "How many entries mention both software and Macintosh?"

**What Makes a Database?**

Technically, people who worry about exact distinctions will probably say that the simplest phone-list and mailing-list programs are not database programs at all, but only list and file managers. Strictly speaking, a database is an ordered collection of data that is arranged so more than one program can access the information. The information structure is independent of the exact structure of each program, and a new program can access the data without knowing how and through which program you entered the original data.

A list or file manager handles a limited number of file structures and ties the data format to a single program. For example, if you write a BASIC program that stores data on a disk, the way the data is stored changes if you change your program. Unless you know exactly how it was stored, you won't be able to retrieve it.

By this definition, a specialized mailing-list program, inventory, or "know your client" reminder program is a list manager, not a database. In fact, most programs that are intended for a particular application don't qualify as full-fledged databases.

A specialized program offers many of the advantages of a database system in a form that's easier to use and often less expensive. A well-designed program allows you to specify how you want your information arranged and presented, but it will probably let you choose only among a limited number of formats for entering data.

Because these programs limit your options for storage formats, they're often able to use data-transfer methods more efficiently than more general programs. Some of the specialized programs perform operations such as sorting much faster than a program that has to deal with a wider range of possibilities.

A last advantage of specialized programs is built-in data editing and formatting. If you're using a real-estate listing program, it might be preprogrammed to require you to fill in a street name, treat an "appliances" entry as optional, and check rental for a valid range between $100 and $10,000. You can program this type of checking in some more general programs, but if you don't have the time or the inclination to learn how, it can be a great help to have it all done for you.

Among the many types of specialized database-like software you can buy for the Apple II family are programs for mail lists, telephone lists, client contacts, recipe lists, home and business inventories, personal book- or record-library programs, breeding lines (either agricultural or genealogical), stamp and coin collections, and many more.

**As is often the case with software, greater power usually comes at the cost of greater complexity.**

If you can't find a program devoted to your particular application, your data doesn't fit into preestablished formats, or you want the flexibility of a general-purpose program, then you may be better off with a true database program.

In the generalized category, you can pick from a wide range of approaches and capabilities. As is often the case with software, greater power usually comes at the cost of greater complexity.

Almost all the databases available for Apples and other personal computers follow the so-called "relational" model, which means that you can think of them as a set of tables or filled-in forms. Within the overall file containing the data, information is grouped in "records." Each record is a single unit that comprises the categories in the database, a single name, address, and phone number in a phone-number list, for instance. In a relational database, each record has exactly the same structure (with different contents), and the file is made up of many of these similar records.


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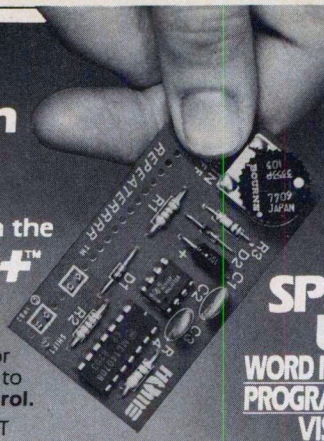

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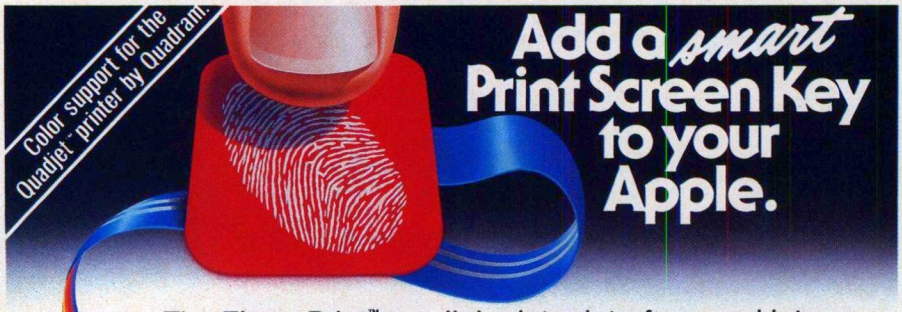


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Because each record is set up in the same way, the database has to store the category names and their positions in the record only once. Then, the program identifies each data item by the "relation" between its record position and the category that corresponds to that position in the overall record structure.

Imagine that the program stored a single copy of a blank questionnaire, along with the answers only from each filled-in copy of the form. When you want to see the information, the program combines the blank copy with the appropriate answers and shows it to you in the proper order.

When you consider relational databases, your fundamental choice is whether you want a menu-driven program or one that requires you to specify commands. Menu-driven programs are often easier to learn, but they are inherently less flexible, and they can seem slow and tedious once you have the operation half memorized.

PFS:File, from Personal Software Corporation, is a good example of a menu-driven program whose advantages outweigh its limitations. According to retailers' reports, it's the best-selling database for the Apple, meaning that most people apparently prefer the menu approach.

Ashton-Tate's dBASE II, which runs under CP/M on the Apple, exemplifies the command-driven approach. Although dBASE II does have a substantial following, many people find it hard to learn (which is why *A+* offers you an ongoing "How to dBASE II" tutorial).

**Database Functions**

Whether menu-driven or command-driven, all databases have some essential jobs to accomplish. Depending on which brand you pick, the terminology or order of steps might vary slightly, but conceptually each one requires a minimum set of operations.

The first task in some database programs is to prepare the file. Many database programs for the Apple need to reformat a whole disk in their special pattern, but others let you share a disk with normal DOS files. In either case, the program commonly asks you to give your file a name.

Some specialized programs let you have only one preset filename or don't use filenames at all. In those cases, you have to be sure to label your disks clearly, especially if you make updates and backups of the same file.

Next you have to decide what data

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to store in the database and how it should be arranged. If you're using a predefined program, you may have a few options, but basically you accept the author's judgment on what information is desirable and how much space to allocate for each item.

If you're using a general database, this step requires a bit of thinking, however. How you divide up your data can make a big difference in ease of extracting the information you want later on. When you work with a pencil and paper, you can write small if you have a long entry for a short blank space, but on a computer each character takes a full position, and you can't squeeze in more than you have reserved room for.

Take the question of what to do with names. If you store names as single units, it's easy to print them out or read them on screen. On the other hand, if you want to sort the list alphabetically, it's much easier if you separate the last name into its own field.

How much space should you allow for a last name? Ng takes 2 letters, but Castagnetto-Waggonner takes 21. Virtually all databases for the Apple require you to use the same amount of space for each similar entry, so if you need 25 letters for any name, then each name in your database has 25 spaces reserved for it, whether it needs it or not. If you allocate too little room, you'll have to truncate names (or even worse, addresses) in the middle. If you allocate too much, you won't be able to fit as many records on each diskette.

A record is easier to read if you can fit it on a single video screen. Many of the more powerful database programs for the Apple let you use multipage

**How you divide up your data can make a big difference in ease of extracting the information.**

forms though, and you can flip back and forth as necessary. Some programs distinguish between the "field labels," the actual character sequences that appear on the screen to identify the fill-in blanks, and the "field names," which are the names you use to specify the field when you ask for a report or to rearrange the categories.

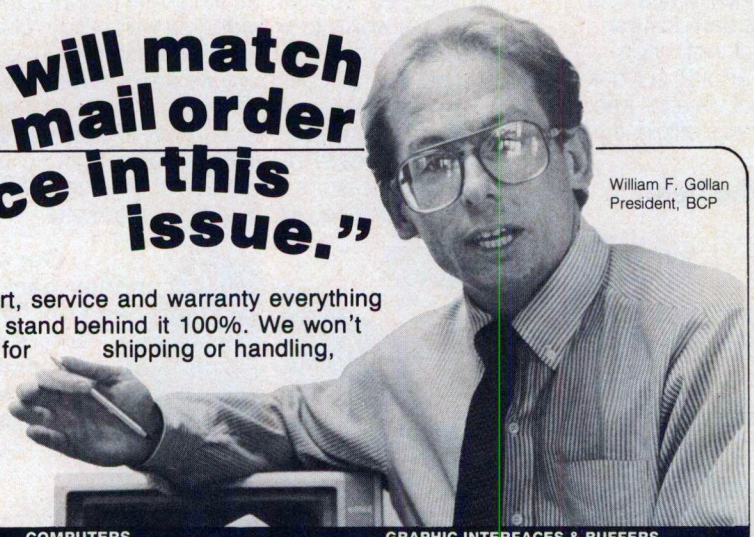
With a visually oriented program such as PFS:File, you define the fields of information you want stored by creating a sample display on the screen (you can later choose other display formats as well). With programs such as dBASE II, which were originally written with simple Teletype-like terminals in mind, the definition process consists of filling in tables.

**Filling in the Blanks**

Once you have defined your file and record, you can start entering your data. In database terminology, if you enter data into an existing record, you're "editing" the record; if you add a new record, you're "appending" or simply "adding."

If you have set up the database well, with clear names and appropriate-size blanks for each field, then anyone should be able to assume the actual data entry workload. A well-designed database should be easily explicable, even obvious, a particularly important consideration for one that won't be used every day, because otherwise even the person who created the database may quickly forget what the labels mean.

In the business world, filling data into existing databases is the largest

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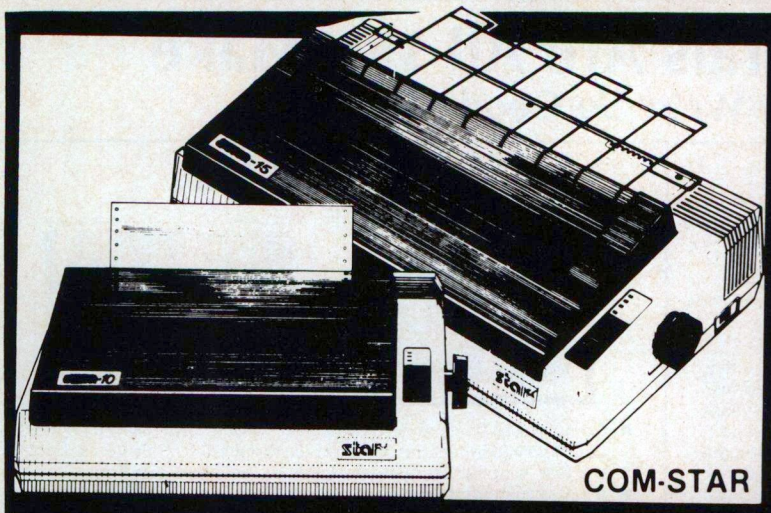


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The COMSTAR T/F (Tractor Friction) PRINTER is exceptionally versatile. It prints 8½" x 11" standard size single sheet stationary or continuous feed computer paper. Bi-directional, impact dot matrix, 80 CPS, 224 characters. (Centronics Parallel Interface).

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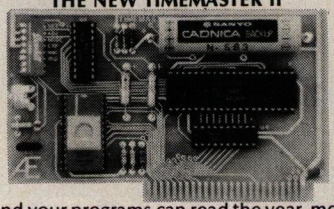
### THE NEW TIMEMASTER II

Automatically date stamps files with PRO-DOS



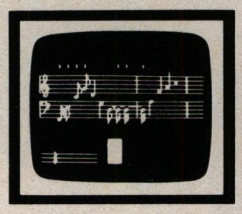
NEW 1984 DESIGN
An official PRO-DOS Clock

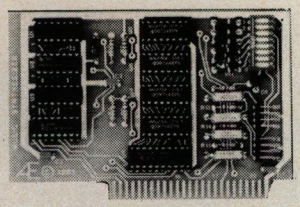
- Just plug it in and your programs can read the year, month, date, day, and time to 1 millisecond! The only clock with both year and ms.
- NiCad battery keeps the TIMEMASTER II running for over ten years.
- Full emulation of ALL other clocks. Yes, we emulate Brand A, Brand T, Brand P, Brand C, Brand S and Brand M too. It's easy for the TIMEMASTER to emulate other clocks, we just drop off features. That's why we can emulate others, but others CAN'T emulate us.
- The TIMEMASTER II will automatically emulate the correct clock card for the software you're using. You can also give the TIMEMASTER II a simple command to tell it which clock to emulate (but you'll like the Timemaster mode better). This is great for writing programs for those poor unfortunates that bought some other clock card.
- Basic, Machine Code, CP/M and Pascal software on 2 disks!
- Eight software controlled interrupts so you can execute two programs at the same time (many examples are included).
- On-board timer lets you time any interval up to 48 days long down to the nearest millisecond.

The TIMEMASTER II includes 2 disks with some really fantastic time oriented programs (over 40) including appointment book so you'll never forget to do anything again. Enter your appointments up to a year in advance then forget them. Plus DOS dater so it will automatically add the date when disk files are created or modified. The disk is over a $200.00 value alone—we give the software others sell. All software packages for business, data base management and communications are made to read the TIMEMASTER II. If you want the most powerful and the easiest to use clock for your Apple, you want a TIMEMASTER II.

**PRICE $129.00**

### Super Music Synthesizer
### Improved Hardware and Software

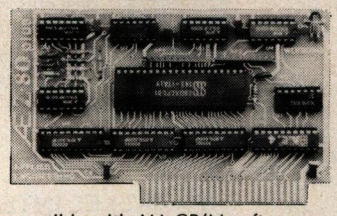




- Complete 16 voice music synthesizer on one card. Just plug it into your Apple, connect the audio cable (supplied) to your stereo, boot the disk supplied and you are ready to input and play songs.
- It's easy to program music with our compose software. You will start right away at inputting your favorite songs. The Hi-Res screen shows what you have entered in standard sheet music format.
- Now with new improved software for the easiest and the fastest music input system available anywhere.
- We give you lots of software. In addition to Compose and Play programs, 2 disks are filled with over 30 songs ready to play.
- Easy to program in Basic to generate complex sound effects. Now your games can have explosions, phaser zaps, train whistles, death cries. You name it, this card can do it.
- Four white noise generators which are great for sound effects.
- Plays music in true stereo as well as true discrete quadraphonic.
- Full control of attack, volume, decay, sustain and release.
- Will play songs written for ALF synthesizer (ALF software will not take advantage of all our card's features. Their software sounds the same in our synthesizer.)
- Our card will play notes from 30HZ to beyond human hearing.
- Automatic shutoff on power-up or if reset is pushed.
- Many many more features.

**PRICE $159.00**

### Z-80 PLUS!



- TOTALLY compatible with ALL CP/M software.
- The only Z-80 card with a special 2K "CP/M detector" chip.
- Fully compatible with microsoft disks (no pre-boot required).
- Specifically designed for high speed operation in the Apple IIe (runs just as fast in the II+ and Franklin).
- Runs WORD STAR, dBASE II, COBOL-80, FORTRAN-80, PEACHTREE and ALL other CP/M software with no pre-boot.
- A semi-custom I.C. and a low parts count allows the Z-80 Plus to fly thru CP/M programs at a very low power level. (We use the Z-80A at fast 4MHZ.)
- Does EVERYTHING the other Z-80 boards do, plus Z-80 interrupts.

Don't confuse the Z-80 Plus with crude copies of the microsoft card. The Z-80 Plus employs a much more sophisticated and reliable design. With the Z-80 Plus you can access the largest body of software in existence. Two computers in one and the advantages of both, all at an unbelievably low price.

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### Viewmaster 80

**There used to be about a dozen 80 column cards for the Apple, now there's only ONE.**

- TOTALLY Videx Compatible.
- 80 characters by 24 lines, with a sharp 7x9 dot matrix.
- On-board 40/80 soft video switch with manual 40 column override
- Fully compatible with ALL Apple languages and software—there are NO exceptions.
- Low power consumption through the use of CMOS devices.
- All connections are made with standard video connectors.
- Both upper and lower case characters are standard.
- All new design (using a new Microprocessor based C.R.T. controller) for a beautiful razor sharp display.
- The VIEWMASTER incorporates all the features of all other 80 column cards, plus many new improvements.

| | PRICE | BUILT IN SOFTSWITCH | SHIFT KEY SUPPORT | LOW POWER DESIGN | 80 COLUMN HOME | 7x9 DOT MATRIX | LIGHT PEN INPUTS | 40 COLUMN OVERRIDE | INVERSE CHARACTERS |
|---|---|---|---|---|---|---|---|---|---|
| **VIEWMASTER** | **179** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** |
| SUPRTERM | MORE | NO | YES | NO | NO | NO | NO | YES | YES |
| WIZARD80 | MORE | NO | NO | NO | NO | YES | NO | YES | YES |
| VISION80 | MORE | YES | YES | NO | NO | YES | NO | NO | NO |
| OMNIVISION | MORE | NO | YES | NO | NO | NO | NO | YES | YES |
| VIEWMAX80 | MORE | YES | YES | NO | NO | YES | NO | NO | YES |
| SMARTERM | MORE | YES | YES | NO | NO | NO | YES | YES | NO |
| VIDEOTERM | MORE | NO | NO | YES | NO | YES | YES | NO | YES |

The VIEWMASTER 80 works with all 80 column applications including CP/M, Pascal, WordStar, Format II, Easywriter, Apple Writer II, VisiCalc, and all others. The VIEWMASTER 80 is THE MOST compatible 80 column card you can buy at ANY price!

**PRICE $179.00**

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- Permits your IIe to use the new double high resolution graphics.
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- PRO-DOS will use the MemoryMaster IIe as a high speed disk drive.
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- Documentation included, we show you how to use all 192K.

If you already have Apple's 64K card, just order the MEMORYMASTER IIe with 64K and use the 64K from your old board to give you a full 128K. (The board is fully socketed so you simply plug in more chips.)

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cost of data processing, and it's certainly one of the most time-consuming. Furthermore, in any large database, a certain amount of erroneous entries are inevitable. It's therefore worthwhile to take some extra time in the design and setup of a major database to make data entry as clear and painless as possible.

Once you've entered your data, you can always go back and edit any of the records. Some databases let you take any existing field contents and change them with a set of editing commands. On others, you have to replace the entire field if you want to make any changes, although the rest of the record remains intact. Some people define "editing" as correcting errors in entries and use "updating" for a deliberate change. Others use the terms interchangeably.

**Reporting**

Assuming that you want to use the database for more than just looking up items on a screen, another key step is to define your reports. This step is perhaps

**In any large database, a certain amount of erroneous entries are inevitable.**

the most complex and difficult. Predefined reports, in fact, are one of the big attractions of specialized database programs.

A report is a listing of some part of the information from your database, arranged in a specified way. Because the computer has no idea of context, you must specify the output form in exquisite detail.

Going back to our telephone list, you can't just say, "Print out a neat list of everyone, arranged by city and state." Instead, you have to say exactly how you want the information sorted, where on each line or page you want the first name, how many blank spaces should follow it, where you want the last name, whether you want parentheses added to area codes, and so on.

Fortunately, database-software developers have recognized the problems and are providing easier ways to define reports. Many systems now let you design a report on-screen, as if your monitor faceplate were a window on your final piece of paper. Some let you do it interactively; on others you must specify your changes and then try them out.

Because report design is complex but easy to change, a good approach is to start out by getting the format down for a simplified version of the report. Then, when that's working, you can add details and worry about the appearance. In the phone-number list, you might start by listing name, city, state, and phone successively in a single line. Once that part is working, you can add parentheses around the area code or see if a two-line listing would be easier to read.

Because defining a formal report can take from several minutes to several hours, many database programs also let you make less formal requests, either for on-screen display or for printout. Unless you plan to use a database only as a link in a complex flow of office paperwork, you'll probably want to make sure that any system you pick has an easy way to deal with quick questions.

One of the nicest features of any database system is that it can find data lost in a mass of details like the proverbial needle in a haystack—providing you can describe in the program's terms how a needle differs from a piece of straw. Not only can most database pro-

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This is the modem that does it all, and does it for less. The Apple Communications Card is on board, so no other interface is needed. It's 300 baud, the most commonly used modem speed. And it comes complete with **Networker** Communications Software on an Apple-compatible disk, giving you features **no** modem offers.

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The **Networker** supports both originate and answer modes, so you can send and receive information, in full or half duplex modes. Just plug it into any slot in your Apple computer, and then into your phone jack. Now you're part of a vast network of computers.

For $179 we include with the **Networker** the **Netmaster** Communications Software for advanced users. **Netmaster** will let you transfer games, computer graphics, programs, sales reports, documents—in fact, any Apple file of any size—to another computer, directly from disk to disk, without errors, even through noisy phone lines.

For transfering information between computers, **Netmaster's** superb error checking and high speed are an unbeatable combination. With a **Netmaster** on each end, you can transfer information three to five times faster than other communications packages like Visiterm™ or ASCII Express™. Error free.

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grams find you all the items meeting certain test criteria, but most can combine tests into complex search specifications. You might ask your database system, for example, to find all the names in your telephone list that were added in March, have an area code of 617 or 202, and do NOT mention CP/M in the comments.

Selecting a subset is a relatively fast operation for a computer, but rearranging the database may be a lengthy one. Suppose you have your telephone database in order by last name and you want to see it in date order, instead. Your database program must look at every record, figure out which one goes first, and then sort them out. If you're using a program that stores all the data in memory (and is therefore limited to files that fit in the free space left after the program and the various parts of the operating systems take their share), the sorting can take place in a few seconds. If the files are long, however, sorting operations can take hundreds or thousands of disk read and write operations.

One way to speed the process up is to "index" the file, rather than sorting it. The process is like making catalog cards for each book in a library and then rearranging the cards rather than moving all the books. Because the index entries are much shorter than the entire records, a database program can rearrange them more quickly. And, as the card catalog in a library lets you go straight to the book you want, the index on a computer lets your database go straight to individual records on the disk without reading through each record to find the one you want.

Whole books are written about single aspects of database design or use. There's clearly more to the subject than what I can cover in this short introduction. Along with the essential functions, database-program designers have included features ranging from musical accompaniment to Roman-numeral output.

A feature that you might find especially worth looking for is the ability to "import" (read files generated by other programs, such as spreadsheets or word processors) and "export" (write files that other programs can read). If you do a lot of searching for names, Soundex or another type of matching system that finds close as well as exact matches can speed your work. And a tutorial mode for learning the program, especially an interactive one, may be worth more than anything else I could add. ✚

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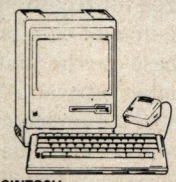

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| | Elite 2, 326K, 80 Track | $ 649 | $429 |
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| * | **Titan/Saturn** RAM Card (II+) | 32K | $ 249 | $169 |
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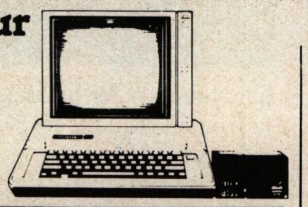

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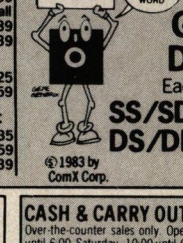


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# DATA

**MACHINE LANGUAGE**
**BY STEVE ROSENTHAL**

## A short glossary of database terminology

**AD HOC QUERY**
A request for information from a database system that was not specifically planned for or preprogrammed into the system. Many database programs for the Apple let you ask such questions as What is the sum of the expenses for all transactions in June? Unfortunately, most require that you formulate the request in a more structured and precise way, such as Sum expenses for month = June.

**APPEND**
To add new records to a database

**ASCENDING**
The order that goes from smallest to largest or first to last. Many database systems sort only in ascending order, but a few also sort in descending order.

**B-TREE**
Short for balanced tree, a way of organizing the pointers to information in databases that allows quick retrieval of any single specified record. So-called B+ or B* trees allow you to list records in sequential order as well.

**BINARY SEARCH**
A method of searching a file or table by successively dividing the database in half until you match the desired value or find that it is missing. Binary searches are most effective when the database is arranged properly and is relatively uniform. Many database systems use this method for locating items in their indexes.

**CODASYL**
An acronym for Conference on Data Systems and Languages, a federally sponsored industry committee. CODASYL developed standards that led to the COBOL language and many of the more complex types of databases.

**DATA**
In the context of computer databases, information in a form that a computer can store or manipulate. Because computer systems can't understand meanings or sense emotional overtones, recorded data often does not include the full dimension of significant information.

**DATABASE**
Most often refers to any clearly identified collection of data. Some people differentiate between a data base (two words), meaning an underlying collection of data in the real world, and a database (single word), a coherent collection of data entered into a computer system. As applied to data in the computer, the term means data organized so that programs can access and update the information.

**DATABASE-MANAGEMENT SYSTEM**
A program or set of programs that provides a framework for creating collections of data for use by different programs and that serves as the interface between the programs and the data. The database-management system (DBMS) can also include a query facility for making individual requests for information from the database and a reporting facility for producing a formatted list of selected data.

**DBMS**
The common abbreviation for database-management system

**DESCENDING**
The order that goes from largest to smallest or last to first. Some database systems for the Apple allow you to specify descending order in certain fields, but many will allow only the more common ascending order.

**DIRECT**
The method of accessing data on a disk or in memory by looking up a key value in an index and then using the associated pointer to find where to read or write to requested data. It is quicker than sequential access, where each record in the file is read or written to in turn.

**FILE**
A collection of information that the operating system thinks of as a single unit. Internally, the database considers the file to be a collection of records, which, in turn, are made up of fields. Some databases can work with multiple files, but others work only with a single file.

**FILE MANAGER**
A limited-function data-management program in which the structure of the data is dependent on the program that creates and maintains it. Unlike a full database-management system, it does not aim to make the data and the program independent of each other.

**FIELD**
An area for recording a single item of data in a database or other data-recording program. A field can hold a number, a name, a yes-no answer, a date, or even a page of text. Conceptually, a field is equivalent to a single fill-in-the-blank line or box on a paper form.

**HIERARCHICAL**
A model for organizing data in a database in which the basic conceptual unit is "ownership"—each item "belongs" to a higher item and claims ownership of items subsidiary to it. This model is used on CODASYL and network-type databases on large computers, but rarely on programs that run on the Apple.

**INDEX**
As a noun, *index* refers to a set of pointers that connect logical values with the location where the applicable data is stored. In some database programs for the Apple, you can have only one index per database. Others allow you to have several.

The index functions much like a card catalog in a library does—if you want records on a certain topic, it's a lot faster to look up the topic in the index and then go directly to the correct location on the shelf, rather than combing through all the books.

As a verb, *to index* means to construct an index file, either for an existing set of records or for data as it is entered into the database.

**ISAM**
An acronym (pronounced eye-sam) for indexed

# BASE

sequential-access method. IBM pioneered this method of organizing data when magnetic tape was the principal means of storing data. Databases that you're likely to find on an Apple seldom use it. ISAM keeps the data in order, making a list of out-of-order items as data is added, deleted, or changed.

**JOIN**

In general, *join* means to combine two databases (used as a noun, it names the result of the combination). In particular, as applied to relational databases, *to join* means to make a new file that contains all the records in a particular file that another file refers to. For example, you can make a stock-pick file by joining an orders file with an inventory file. Joining often takes a lot of disk activity and can be slow on Apples without hard disks.

**KEY**

The part of a record that is the identifier when you index or sort records. In the telephone book, for example, the key is the subscriber's name. In a database, it's often the order or transaction number, date, a name, or a partial number.

Some databases for the Apple allow you to have duplicate keys; others require that the key fields be unique.

**LOCKING**

The process of temporarily shutting out other users in a multiuser system while a transaction to update the file is completely processed. Locking can occur at the individual-record level ("record locking") or at the file level ("file locking"). Locking is necessary so that users don't get data that has been partially updated.

**MASK**

A pattern for checking data in a database to make sure it has the right form for entries in that field. For example, a mask might specify 3 digits for an area code or two letters for a state abbreviation.

**NONPROCEDURAL LANGUAGE**

A method of telling a database system what type or range of data you are looking for, rather than how to find it. Some people prefer this method, especially for ad hoc (unplanned) queries.

**POINTER**

A number that tells where to find some item of data. Most databases for the Apple use an indexed system to keep track of where data is stored on the disk. In these systems, you use a "key" to request a data record—the system then searches a table for the key and reads the associated pointer to find the location on the disk of the applicable record.

**PROTECTED**

In reference to a computer display, parts of the display that are meant as guides for filling in information, which are protected so they can't be overwritten or erased during the data-entry process. In an address file, for example, the legend NAME: might be protected, showing you where to fill in the current person's name, yet preventing you from overwriting the NAME: legend.

On the Apple II and III, protected fields are often shown in other colors or as dimmed, highlighted, or inverted video. On the Macintosh, various shadings or type styles will probably be used to highlight protected fields.

**QUERY**

To make a request for information from a database system (or, as a noun, the request itself). Some systems let you make ad-hoc queries (see above), but others restrict you to the more structured report process.

**QUERY BY EXAMPLE**

To ask for information from a database system by defining the qualifications for selected records on a sample record, rather than describing a procedure for finding the information. The nonprocedural method is available on several databases for the Apple, including the popular PFS:File.

**RECORD**

The collection of information about a single person, item, or transaction in a database that's moved around as a unit when the database is sorted or reordered. In the office analogy, a record is a single folder made up of one or more pages, each with several fields full of information.

**RELATIONAL DATABASE**

A database whose basic organization is modeled after a table, with rows containing the individual records and data stored in a series of columns. For example, a name-and-address file might have columns for name, street, city, state, ZIP code, area code, and telephone number. You create a record for each person by filling in each field starting with the name.

**REPORT**

An on-screen display or printed listing showing selected information extracted from a database (and, as a verb, the act of generating this listing). Most database systems allow you to design your own report formats, and some allow quite extensive editing and mathematical processing.

**SEQUENTIAL**

Information that is stored as a list. Sequential organization is efficient for producing reports in the same order as that in which the information is stored, but it is hard to update or look at the list in other sequences. Most database systems use direct-access methods.

**SORT**

To rearrange the order of information in a database system. Some of the more limited programs for the Apple allow you to sort the record order only by the one field that you previously defined as the "key"—others allow you to specify the sort field at will.

Because a personal computer such as the Apple doesn't have the space to program it to understand significance, all sorts are strictly by numeric or alphabetical order—you can't ask, for example, to have a list of foods sorted by order of spiciness, unless you have included a numeric value for that attribute.

**UPDATE**

To change information in a database, or to fill in information in an existing record. +

1984 is turning out to be a big year for Apple Computer. First, the company shocked us with an original and daring television commercial heralding the coming of its Macintosh computer. Then it rolled out the Macintosh, amid tremendous fanfare. And on April 24, 1984, Apple grabbed the limelight again, as it unveiled its newest-generation computer, the IIc, at a huge party in San Francisco's Moscone Center, site of the 1984 Democratic Convention. Designed for the emerging mass market in the home, the IIc is elegant and irresistible.

Reflecting a new design trend, the IIc is a lighter cream color than older

LETS YOU TAKE

# THE APPLE IIc

Apple models, and the lines are sleeker. Crammed into a 7½-pound unit is 128K RAM, a built-in 143K disk drive, a full-size keyboard, two RS-232 ports (for modem and printer), one standard video-output port, one high-resolution-video-output port, and a mouse/joystick port, all for the suggested price of $1295. A similarly equipped IIe would retail for more than $2000.

Unlike most other new computers, the IIc does not have a problem of insufficient available software, since it is compatible with most Apple II software. Apple has developed special editions of four software packages, Apple Works, Apple Access II, Apple Logo II, and Apple Education Classics, which highlight some of the special features of the IIc, such as the mouse, 128K RAM, and double high-resolution-graphics capabilities. Apple has also worked with selected third-party software developers to enhance existing favorites, including the PFS Series, Bank Street Writer, Dollars and Sense, and more.

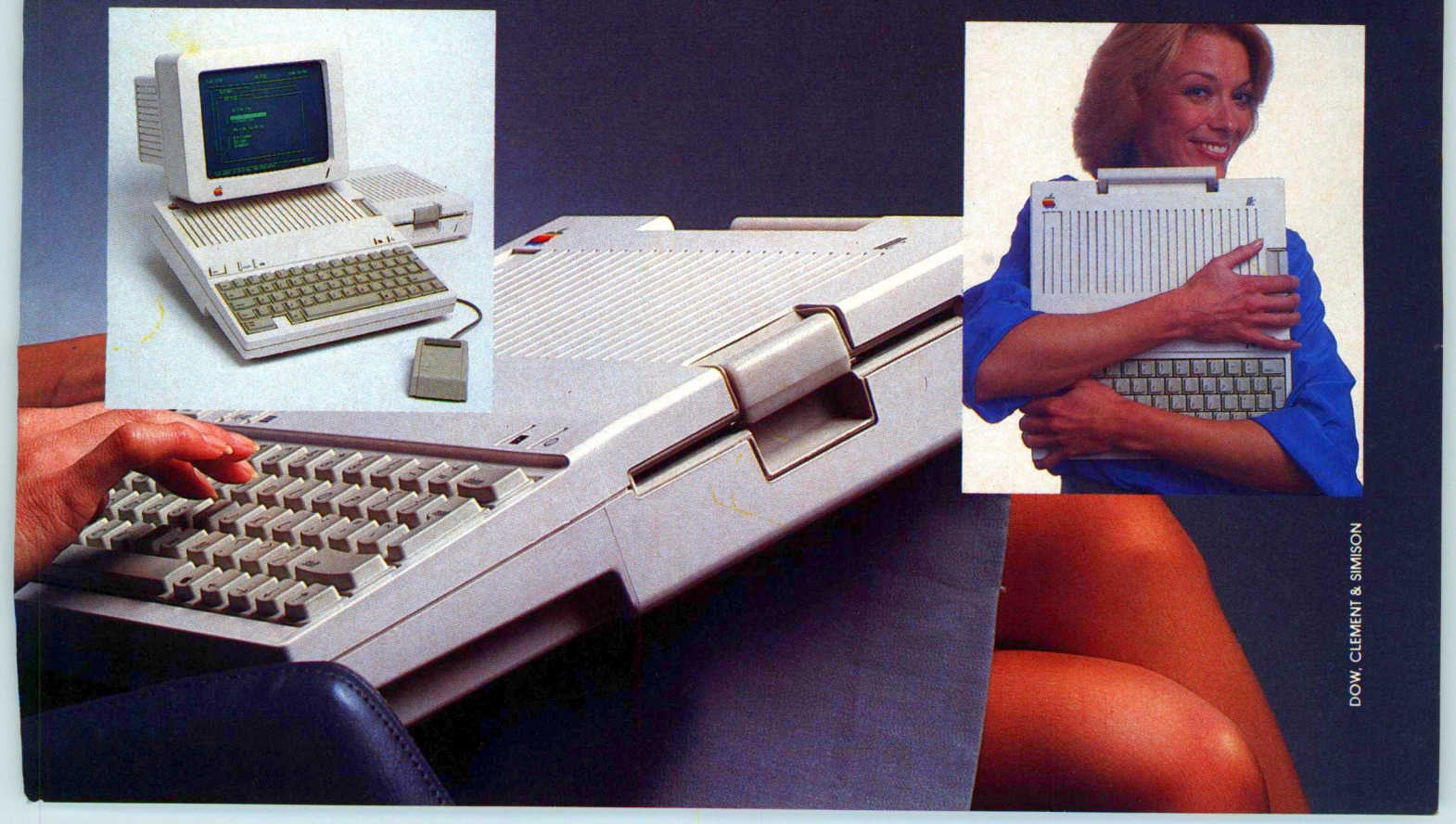
One of the more exciting aspects of the IIc's introduction is the availability of an optional 24-line-by-80-column flat-panel display (LCD). As usual, Apple is in the vanguard of technology, and now that the much-heralded full-screen LCD technology is finally here, it is not surprising that Apple Computer is one of the first companies to take advantage of it. Compact and light, the flat screen combines with the main unit to make an impressive, portable package.

Apple is also providing other options, including a compact nine-inch video-display monitor, an external disk drive, a mouse cursor controller, a low-cost printer, a carrying case, and more. The following pages are an in-depth examination of the IIc, both inside and out. We'll start with software, move to the peripherals, and finally take a look at the power supply.

**Born with a Software Spoon**

At the time of the IIc's introduction,


ADVANTAGE OF A WEALTH OF AVAILABLE SOFTWARE.



DOW, CLEMENT & SIMISON

the software scene for the new computer looks promising. The Apple IIc was introduced with a huge amount of available software, since it can run most of the programs that have been written for the other Apple IIs. In creating the IIc, Apple has simplified the Apple II into a product that provides a complete computer solution in one packing box. Consistent with this effort is Apple's focus on simplifying software solutions for Apple IIc owners. The result is a vast array of software that is compatible with the IIc, not programs that are still in development, but ones that are available immediately in the fields of education, productivity enhancement, personal finance, communications, and entertainment.

Although some of the Apple IIc software is new, written specifically for the Apple IIc computer, other programs are compatible Apple II favorites you've seen before. By seeding 100 software manufacturers with Apple IIc developers' toolkits and computers, Apple seems to be doing its best to insure the success of its latest product with plenty of software to come.

**The New Software**

Along with its bold departure from the traditional, boxy Apple II family look, the Apple IIc also promises a facelift for some old software standbys. Simultaneously timed with the new computer's debut is the release of some of the Apple II's all-time best-sellers written specifically for the Apple IIc.

These enhanced products take advantage of some or all of the Apple IIc's special features, including 128K memory, double hi-res graphics, 40/80-character screen width, and the mouse. At introduction, Apple touts these enhanced programs as "featured products" in a Software Sampler brochure.

Four of the Apple IIc's featured programs come from Apple, and the rest of the programs are from well-known software developers. From Apple we have:

- **Apple Logo II**—a computer language for family and school use that allows you to write programs without previous computer instruction. Logo is probably best known for two attributes.

  One is "turtle graphics," which enables even young children to create intricate graphic designs on a computer. The second is the language's ability to let you break problems down into small components, making complex programming tasks simple and fun to learn. Apple Logo II is a brand-new version of Logo with many special features.
- **The Apple Education Classics**—a time-tested combination of two educational packages that are standard favorites on the Apple II computer. Elementary, My Dear Apple consists of four different programs that teach everything from basic math to word recognition and spelling to business skills via a simulated lemonade-stand business. The Shell Games is an educational quiz game with some 180 built-in quiz questions and the ability

*Above: A close-up view of the IIc keyboard*
*Center: A rear view of the IIc, showing the carrying handle and built-in connector ports*
*Far right: An Apple IIc with second disk drive, mouse, and portable flat-panel LCD monitor*

to create your own personalized quizzes as well.

- **AppleWorks**—an integrated database-management, word-processing, and spreadsheet-analysis program. AppleWorks combines the three most popular productivity applications into one software package for writing letters and reports, performing financial calculations, and filing information. The strength of the integrated program is that it allows you to switch easily from one application to the next, so you can mix text or information from any file to produce your letter or report.
- **Apple Access II**—a program that allows your Apple IIc—when you use it with an Apple-compatible modem—to communicate with other computers over the telephone lines. With it you can log on to computer information services, join bulletin boards, transmit letters via electronic mail, receive instant news and stock quotes, and become involved in the world of telecommunications.

The remaining new featured software programs for the Apple IIc are presented in the Apple IIc Software chart (see page 36).

**Not-So-New-Software**

Riding on the crest of the thousands of available programs for the Apple II, the Apple IIc begins its product life with an extensive network of established software. Naturally, the first question that comes to mind is whether all 20,000+ Apple II programs are fully compatible with the new Apple IIc. Though the answer is generally "yes," the only way to be really sure is to try each product on an Apple IIe and an Apple IIc.

For your edification, we've checked on 236 Apple IIe programs in education, productivity enhancement, communications, entertainment, and system utilities to see if they're compatible with the IIc. You'll find the results in the "Apple IIc Compatibility Chart" that accompanies this article (see page 38).

**Future Software**

The list of software written specifically for the Apple IIc is certain to mushroom within the next year. Apple has provided approximately 100 software developers with technical information and an Apple IIc, and these companies are currently working on new programs specifically for the new Apple (see page 38).

**Helping Hands for Your IIc**

If you get a new IIc, it needn't stand alone. Although Apple promises that you'll get a complete system in the original box, it has also done a lot of work creating paths for expanding your system. New peripherals form an important part of Apple's IIc strategy.

The most dramatic new device is the flat-screen LCD display. Although this alternative to the traditional bulky monitor won't be available until fall, it should transform the IIc into a featherweight.

The display is small, lightweight, and portable, weighing only 2½ pounds and measuring only 11½ inches high by 6 inches wide and 1½ inches thick. The display can show a full screen of graphics or a full 80 columns by 25 lines of text, which means you can use it in place of the television-like monitor usually associated with computers. The LCD display is not only compact, but it also uses a minuscule amount of electricity, perfect for transforming the Ap-

ple IIc into a truly portable computer system.

The LCD technology is similar to that used in many electronic wristwatches and calculators. LCD stands for "liquid crystal display," which refers to a special "liquid crystal" substance that is normally transparent but turns black when a small amount of electricity is present. By delivering electricity to precise locations, the computer can turn any point on the display either on or off, thereby creating images on the display.

Although LCD technology has been around for many years, the cost of the technology has been too high to use in full-screen computer displays. The only practical uses were in products that had a small display area, such as wristwatches, calculators, and other electronic devices. Apple is the first major computer manufacturer to offer a full-screen LCD display that features both 80 columns by 24 lines of text and high-resolution graphics capabilities.

Until the LCD display becomes available, Apple is offering several other display options. The IIc Monitor sports a 9-inch screen in a compact and stylish package that matches the IIc's case. It's a green-screen monochrome monitor, with a standard video input. Display format is the same as that of the expanded IIe: 24 lines of 80 characters each, or 560 pixels by 192 pixels in double-hi-res graphics.

If you want to use a color or black-and-white television, the basic IIc package includes an RF modulator to produce a signal that you can send right into your TV antenna terminals. For countries that use the PAL color system (mostly in Europe), the modulator comes in a PAL version as well. Thus, you can use the IIc with virtually any TV set in the world.

The video connector on the back of the IIc makes RGB signals available for use on higher-quality color monitors. Apple isn't announcing any of its own RGB monitor products with the IIc, but the connector does indicate future interest, and outside vendors apparently already have developed cables to connect the IIc with many standard RGB color monitors.

**Down on Paper**

Another supporting product that should prove intriguing is the new Scribe printer. It's a "thermal transfer" printer, meaning that it uses ordinary paper but prints by pressing a heated element against a special ribbon. The result is quiet, respectably fast (60 to 80 characters per second), and inexpensive—the price hadn't been set when *A+* received a demonstration, but Apple expected it to be close to $300.

What's more, the printer produces color! With a color ribbon and the right software, the Scribe can print in four colors and their combinations. You can also use an all-black ribbon for greater economy.

Although thermal ribbons should cost "less than $10," they'll add up if you do a lot of printing (just like carbon-film ribbons do on a typewriter). So Apple is also offering the Imagewriter printer as an alternative for the IIc. It's the same printer that works with the Macintosh and IIe—all you need is the right accessory kit from Apple, which includes cable and instructions.

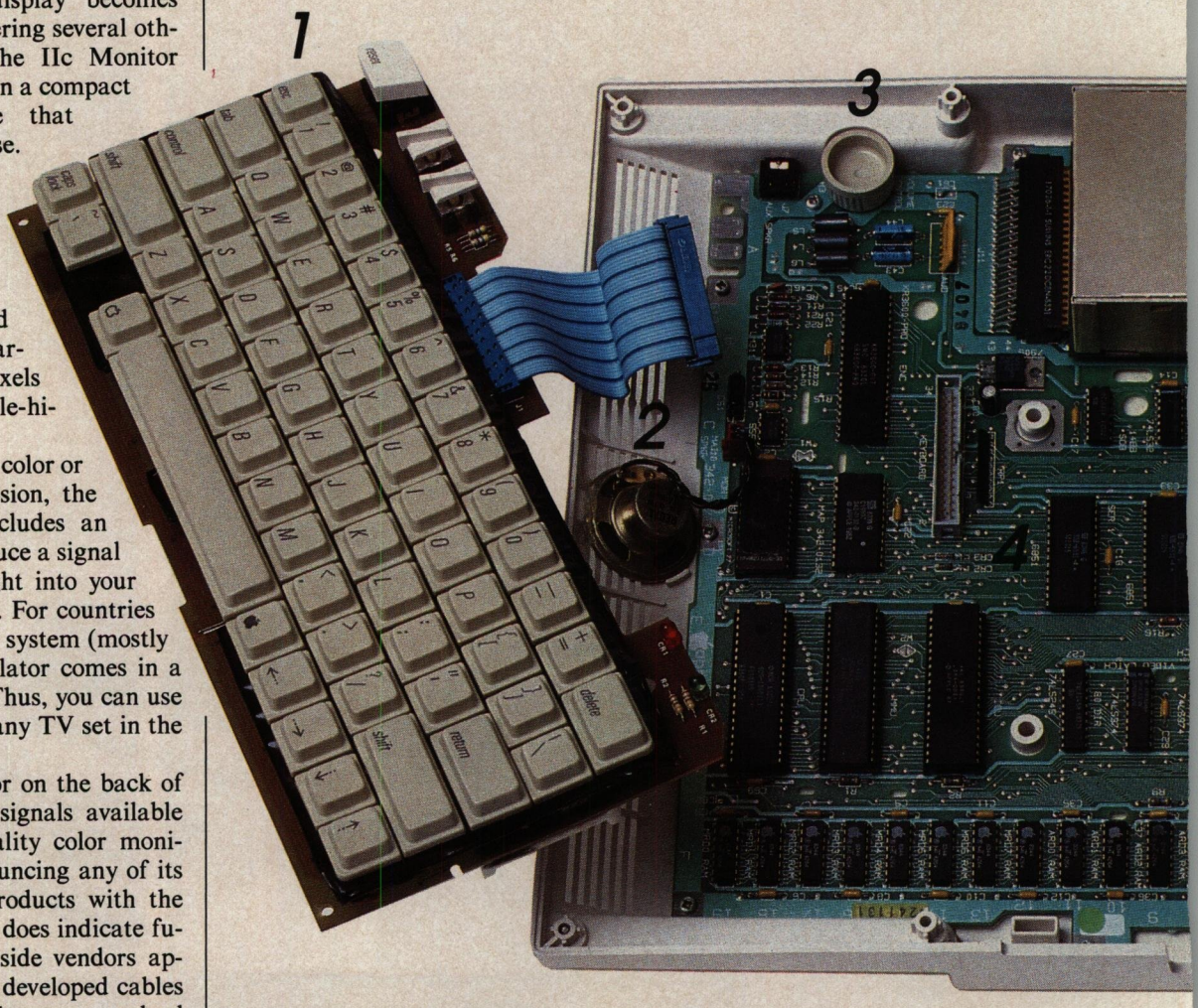
**Another Drive for Your Money**

A single disk drive may not be enough for you, so a plug-in second drive in its own case will be waiting for you on dealers' shelves. Like the built-in drive, it is a half-height drive with 143K capacity. Although Apple is saying officially that it is sticking with the single-sided 143K format for compatibility, the design seems to provide for the use of other formats sometime in the future.

The drive connector also has the greater part of the internal IIc bus, so if anyone designs a CP/M card or memory expansion unit, that's where it will be connected.

**The List Goes On**

For connecting to data networks and exchanging information over the phone, Apple recommends its existing




*A look inside the Apple IIc, showing: (1) the durable full-travel keyboard, (2) the internal speaker, (3) the volume-control knob, (4) the motherboard with low-power CMOS chips, (5) the internal power supply, (6) the I/O connectors, and (7) the half-height 5¼-inch disk drive*

300 and 1200-bit-per-second Applemodems and the new Access II software package. If you already have another brand, there's no reason why any industry-standard modem shouldn't work fine, however.

You'll probably have to stick with Apple for the optional mouse (which, except for case design, is the same as the mice on other Apple products), but most II-family game controllers work in the IIc with the appropriate plug adapter, if necessary.

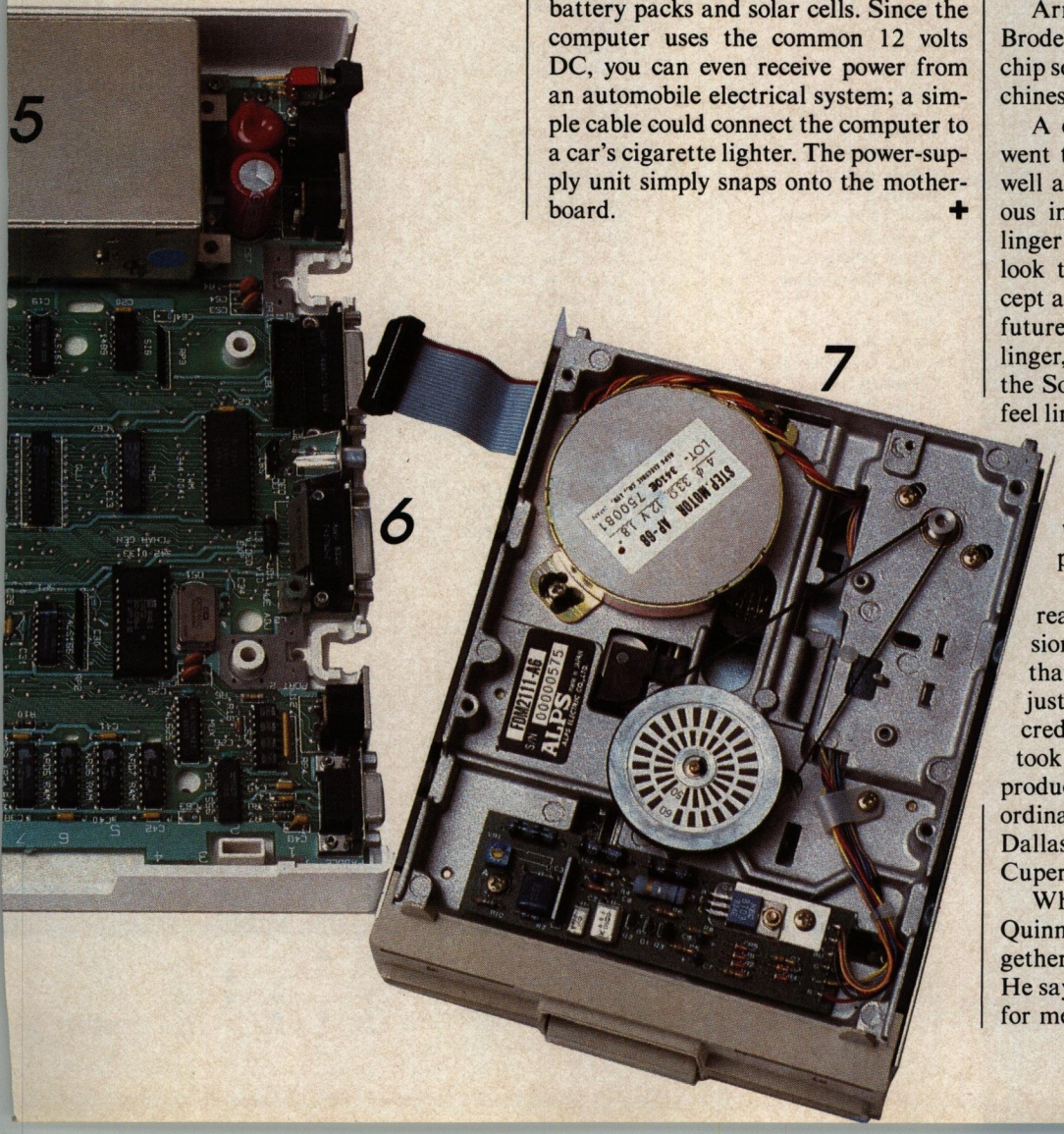
If you want to carry your IIc around, Apple will be selling a small zippered canvas case. The version we saw didn't have room for the CRT monitor, probably because the company expects you to choose the flat-panel display if you are going to be traveling with the unit.

**What Makes It Run**

One of the less obvious innovations in the Apple IIc is the way electrical power is supplied to the computer. The IIc's power supply has two main components, an external transformer and an internal power-supply unit. The external transformer converts the 110 volts of AC household line voltage into 12 volts DC for the computer's use. It makes the IIc safer to use than computers with internal transformers, since there are no high voltages inside the computer case. The transformer is 5¼ inches long by 2¾ inches wide by 2½ inches high, weighs 3½ pounds, and has a 12-foot cord.

The internal power-supply unit (the small metal box visible at the top of the circuit board below) is a marvel of engineering. Designed by Apple and built by Astek, the unit is approved by both UL and the FCC. It weighs slightly over half a pound and measures a mere 4¼ x 3 x 1½ inches, which is much smaller and lighter than most existing computer power supplies.

The unit is so well built that although it is designed to use 12 volts, it can accept voltages as low as 7 volts and as high as 24 volts. This versatility enables the computer to get power from a wide range of power sources, including battery packs and solar cells. Since the computer uses the common 12 volts DC, you can even receive power from an automobile electrical system; a simple cable could connect the computer to a car's cigarette lighter. The power-supply unit simply snaps onto the motherboard. ✚




## *c BEFORE e, EXCEPT AT THE MARKET*

The IIc that you see today is not an instant reaction to the rise of lap-size computers, but a long-evolving Apple project that actually antedates the IIe. In the view of the development team, the IIc is a natural outgrowth of Apple technology and attitudes, and the team is just one part of a large network of people at Apple that contributed to the project.

The original impetus for both the IIc and IIe products was Apple's early realization that creating a custom set of chips was one way to upgrade the original Apple II and II Plus. At the same time, some of the Apple staff began pushing for a machine that would be complete in itself, without requiring slots and plug-in cards.

The II family had served Apple well, however, and extending that family seemed like a better idea than heading off in a new direction. The ultimate decision was to produce both machines—the more similar IIe first, and after that the less similar IIc.

Armed with that knowledge, Walt Brodener, who designed the custom chip set, put in all the features both machines needed.

A design team led by Peter Quinn went to work on the electronic guts as well as the outer package. World-famous industrial designer Hartmut Esslinger developed the "Snow White" look that became the packaging concept and that Apple plans to use for all future computers and peripherals. Esslinger, who is best known for designing the Sony Walkman and the Sony Profeel line, consulted with Apple throughout the design stages of the IIc. Joe Ennis at Apple picked up responsibility for the logic design when Brodener went on to other projects.

From there, the team grew and reached out to other Apple divisions. Project leader Quinn told *A+* that it would be unfair to single out just a few individuals. "It was an incredible amount of teamwork that took this project from scratch to full production in 17 months—we had coordination between [Apple factories in] Dallas, Singapore, Cork [Ireland], and Cupertino."

What about the future? After a rest, Quinn said, his group plans to stay together and tackle some other projects. He says of his crew, "They like working for me—and I like working for them."

# IIc SOFTWARE

BY CANDACE DE SANTIS AND JONATHAN NEHER

The following chart lists new products that are being developed for the Apple IIc. It indicates the special features of each piece of software, including use of the mouse cursor controller, double hi-res graphics, 128K memory, and 40/80-character screen width. For further details on any of these products, circle the appropriate Reader Service Card number in this issue of *A+*.

Other companies that have software in the works for the Apple IIc are:

Addison-Wesley, Applied Software Technology, BPI Systems, BPS, CDEX, Chalkboard, Creative Publications, Cyberlynx, Davidson & Associates, Discwasher, Edu-ware Services, Encyclopaedia Britannica, EPYX/Automated Simulations, Grolier Electronic, Harcourt Brace Jovanovich, Hayes Microcomputer Products, HESware, Houghton Mifflin, Infocom, Koala Technologies, Kriya Systems, Kurta, Magellan Computer, McGraw-Hill, MECA, MECC, Microcom, Milliken Publishing, Mindscape, Muse Software, Parker Brothers, Peachtree Software, Penguin Software, Prometheus, Random House, Rader's Digest Services, Society for Visual Education, Sorcim Corporation, Sterling Software, Sublogic Communications Corp., Sunburst Communications, Syntauri, Telos Software Products, VisiCorp

KEY:
M = Mouse
DHR = Double Hi-Res Graphics
128K = 128K Memory
40/80 = 40/80 Column
80 = 80 Column Only
IIe = Compatible with the IIe
# = Reader Service Card Number

| | | M | DHR | 128K | 40/80 | 80 | IIe | # |
|---|---|---|---|---|---|---|---|---|
| **COMMUNICATIONS** | | | | | | | | |
| Apple Access II | Apple Computer | | | ● | ● | | | 800 |
| CompuServe | CompuServe | | | | | | ● | 801 |
| PFS:Access | Software Publishing | | | | | | ● | 802 |
| Transend | Transend Corporation | ● | | ● | ● | | | 803 |
| **EDUCATION** | | | | | | | | |
| Algebra Arcade | Wadsworth Publishing | ● | | | | | | 804 |
| Alien Action | DLM | | | | | | ● | 805 |
| Alien Addition | DLM | | | | | | ● | 806 |
| Alligator Alley | DLM | | | | | | ● | 807 |
| Alligator Mix | DLM | | | | | | ● | 808 |
| Alphabet Circus | DLM | | | | | | ● | 809 |
| Apple Logo II | Apple Computer | ● | | ● | ● | | | 810 |
| CBS S.A.T. | CBS Software | | | | | | ● | 811 |
| Color & Shape Rodeo | DLM | | | | | | ● | 812 |
| Critical Reading | Borg-Warner | | | | | | ● | 813 |
| Crypto Cube | Designware | ● | ● | ● | | | | 814 |
| Demolition Division | DLM | | | | | | ● | 815 |
| Dinosaur | Advanced Ideas | | | | | | ● | 816 |
| Dragon Mix | DLM | | | | | | ● | 817 |
| Electric Road | Rand McNally & Co. | ● | ● | | | | | 818 |
| Elementary Language Arts | Borg-Warner | | | | | | ● | 819 |
| Entrepreneur | Strategic Management | ● | | ● | ● | | | 820 |
| Fact and Fiction Tool Kit | Scholastic | ● | ● | ● | ● | ● | | 821 |
| Factor | Hayden Software | | | | | | ● | 822 |
| For Teachers Only | DC Heath | | | | | | ● | 823 |
| Geometric Concepts | Borg-Warner | | | | | | ● | 824 |
| Idea Invasion | DLM | | | | | | ● | 825 |
| Jr. High Language Arts | Borg-Warner | | | | | | ● | 826 |
| Juggle's Rainbow | The Learning Co. | | | | | | ● | 827 |
| Knoware | Knoware | | | | ● | | | 828 |
| Lucky's Magic Hat | Advanced Ideas | | | | | | ● | 829 |
| Magic Spells | The Learning Co. | | | | | | ● | 830 |
| Master Match | DLM | | | | | | ● | 831 |
| Master Match | Advanced Ideas | | | | | | ● | 832 |
| MasterType | Scarborough Systems | | ● | ● | | | | 833 |
| Meteor Mission | DLM | | | | | | ● | 834 |
| Meteor Multiplication | DLM | | | | | | ● | 835 |
| MicroTyping II | Hayden Software | | | | | | ● | 836 |
| Minus Mission | DLM | | | | | | ● | 837 |
| MopTown Hotel | The Learning Co. | | | | | | ● | 838 |
| MopTown Parade | The Learning Co. | | | | | | ● | 839 |
| Music Fundamentals | Silver Burdett | | | | | | ● | 840 |
| Number Farm | DLM | | | | | | ● | 841 |
| Pick the Numbers | DC Heath | | | | | | ● | 842 |
| Picture Programming | John Wiley & Sons | | | | | | ● | 843 |
| Quill | DC Heath | | | | | | ● | 844 |
| Quilt | John Wiley & Sons | | | | | | ● | 845 |
| Rocky's Boots | The Learning Co. | ● | | | | | | 846 |
| Science Vocabulary Disk | Silver Burdett | | | | | | ● | 847 |
| Sentence Structure | Borg-Warner | | | | | | ● | 848 |
| Spellagraph | Silver Burdett | | | | | | ● | 849 |
| Spellakazam | Silver Burdett | | | | | | ● | 850 |
| Spelling Data Disk | Silver Burdett | | | | | | ● | 851 |
| Spelling Wiz | DLM | | | | | | ● | 852 |
| Stickybear Basket Bounce | Xerox Education Pub. | | | | | | ● | 853 |
| Stickybear Bop | Xerox Education Pub. | | | | | | ● | 854 |
| Stickybear Shapes | Xerox Education Pub. | ● | ● | | ● | | | 855 |
| The Apple Education Class | Apple Computer | | ● | | | | | 856 |
| The Game Show | Advanced Ideas | | | | | | ● | 857 |
| Tic Tac Show | Advanced Ideas | | | | | | ● | 858 |
| Time and Seasons | Rand McNally & Co. | | | | | | ● | 859 |
| Unlocking the Map Code | Rand McNally & Co. | | | | | | ● | 860 |
| Verb Viper | DLM | | | | | | ● | 861 |
| Weather or Not | Rand McNally & Co. | | | | | | ● | 862 |
| Wiz Works | DLM | | | | | | ● | 863 |
| Wizard of Words | Advanced Ideas | | | | | | ● | 864 |
| Wizware Square Pairs | Scholastic | | | | | | ● | 865 |
| Wizware Turtle Tracks | Scholastic | | | | | | ● | 866 |
| Word Invasion | DLM | | | | | | ● | 867 |
| Word Man | DLM | | | | | | ● | 868 |
| Word Master | DLM | | | | | | ● | 869 |
| Word Radar | DLM | | | | | | ● | 870 |
| Word Structure | Borg-Warner | | | | | | ● | 871 |
| **UTILITY** | | | | | | | | |
| Cricketware | Street Electronics | ● | ● | | | | | 872 |
| Merlin | Roger Wagner Pub. | | | | ● | | | 873 |
| Merlin Pro | Roger Wagner Pub. | | | ● | ● | | | 874 |
| Routine Machine | Roger Wagner Pub. | | ● | ● | | | | 875 |

## ENTERTAINMENT

| | | M | DHR | 128K | 40/80 | 80 | IIe | # |
|---|---|---|---|---|---|---|---|---|
| Archon | Electronic Arts | | | | | | ● | 876 |
| Axis Assassin | Electronic Arts | | | | | | ● | 877 |
| Choplifter | Brøderbund | | | | | | ● | 878 |
| Crime Stopper | Hayden Software | ● | | ● | | | | 879 |
| Day | Reston | | ● | | | | | 880 |
| Dolphin's Pearl | Reston | | ● | | | | | 881 |
| Drágon's Keep | Sierra On-Line | | | | | | ● | 882 |
| Frogger | Sierra On-Line | | | | | | ● | 883 |
| GO | Hayden Software | ● | | ● | | | | 884 |
| Hard Hat Mack | Electronic Arts | | | | | | ● | 885 |
| How About a Nice Game of Chess | Odesta | ● | ● | ● | ● | ● | | 886 |
| King's Quest | Sierra On-Line | | ● | ● | | | | 887 |
| MORL | Reston | | ● | | | | | 888 |
| Movie Maker | Reston | | ● | | | | | 889 |
| Music Construction Set | Electronic Arts | ● | | | | | | 890 |
| Mychess II | Datamost | | ● | | | | | 891 |
| Odin | Odesta | ● | ● | ● | ● | ● | | 892 |
| One on One | Electronic Arts | | | | | | ● | 893 |
| Othello | Hayden Software | ● | | ● | | | | 894 |
| Pinball Construction Set | Electronic Arts | ● | | | | | | 895 |
| Reversal | Hayden Software | ● | | ● | | | | 896 |
| Sargon II | Hayden Software | | | | | | ● | 897 |
| Sargon III | Hayden Software | ● | ● | ● | | | | 898 |
| Skyfox | Electronic Arts | | | | | | ● | 899 |
| Star Maze | Sir-Tech | | | | | | ● | 900 |
| The Last Gladiator | Electronic Arts | | | | | | ● | 901 |
| The Quest | Penguin Software | | ● | | | | | 902 |
| The Standing Stones | Electronic Arts | | | | | | ● | 903 |
| Transylvania | Penguin Software | | ● | | | | | 904 |
| Troll's Tale | Sierra On-Line | | | | | | ● | 905 |

## PRODUCTIVITY

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AppleWorks | Apple Computer | | | ● | | ● | | 906 |
| Bank Street Writer | Brøderbund | ● | ● | ● | ● | ● | | 907 |
| Bookends | Sensible Software | | | | | | ● | 908 |
| Cut & Paste | Electronic Arts | ● | | ● | ● | | | 909 |
| Dollars and Sense | Monogram/Tronix | ● | | ● | ● | | | 910 |
| F.C.M. | Continental Software | ● | | ● | ● | | | 911 |
| Financial Cookbook | Electronic Arts | ● | | | | | | 912 |
| Graphics Department | Sensible Software | ● | | | | | | 913 |
| Graphics Magician | Penguin Software | ● | ● | | | | | 914 |
| Home Accountant | Continental Software | ● | | ● | ● | | | 915 |
| Investor's Workshop | Dow Jones | | | | | | ● | 916 |
| Jack 2 | Business Solutions | | | | | | ● | 917 |
| Jane | Arktronics | ● | | ● | | | | 918 |
| Lexicheck IIe | Quark | ● | | ● | ● | | | 919 |
| List Handler | Silicon Valley Systems | | | | | | ● | 920 |
| List Handler | Advanced Logic Systems | | | | | | ● | 921 |
| Magicalc | Artsci | | | ● | ● | | | 922 |
| Management Systems | DC Heath | | | | | | ● | 923 |
| Micro Cookbook | Virtual Cominatics | ● | | ● | ● | | | 924 |
| Multiplan | Microsoft | | | ● | | | | 925 |
| Notebook Filer | DC Heath | | | | | | ● | 926 |
| ORCA/Host | Hayden Software | | | | | | ● | 927 |
| ORCA/M | Hayden Software | | | | | | ● | 928 |
| Personal Tax Plan | Aardvark/McGraw-Hill | | | | | ● | | 929 |
| PFS:File | Software Publishing | | | | | | ● | 930 |
| PFS:Graph | Software Publishing | | | | | | ● | 931 |
| PFS:Report | Software Publishing | | | | | | ● | 932 |
| PFS:Write | Software Publishing | | | | | | ● | 933 |
| Report Card | Sensible Software | | | | | | ● | 934 |
| Screen Writer II | Sierra On-Line | ● | | ● | ● | | | 935 |
| Sensible Speller | Sensible Software | ● | | | | | | 936 |
| Spell Handler | Advanced Logic | | | | | | ● | 937 |
| Tax Mini-Miser | Sunrise | | | | | | ● | 938 |
| Tax Preparer | Howardsoft | | | ● | ● | | | 939 |
| The Complete Graphic System | Penguin Software | ● | ● | | | | | 940 |
| ThinkTank | Living Videotext | | | | | | ● | 941 |
| TK!Solver | Software Arts | | | ● | ● | | | 942 |
| Trader's Accountant | Summa Software | | ● | ● | ● | | | 943 |
| Trader's Data Manager | Summa Software | | ● | ● | ● | | | 944 |
| Trader's Forecaster | Summa Software | | ● | ● | ● | | | 945 |
| Typing Tutor III | Simon and Schuster | | | | | | ● | 946 |
| VisiCalc IIe | Software Arts | | | ● | ● | | | 947 |
| VisiCalc A.V. | Software Arts | | | ● | ● | | | 948 |
| Winning on Wall Street | Summa Software | | ● | ● | ● | | | 949 |
| WizType | Sierra On-Line | | ● | | ● | | | 950 |
| Word Handler | Silicon Valley Systems | | | | ● | | | 951 |
| Word Handler | Advanced Logic | | | | | | ● | 952 |
| Word Juggler IIe | Quark | ● | | ● | ● | | | 953 |
| Write Choice | Roger Wagner Pub. | | | | ● | | | 954 |

### IIc INSTRUCTION PROGRAMS

Snuggled within the packing box of the Apple IIc are six disks of interactive software programs that come with the machine. Aimed at computer novices, the first disk is an introduction to the IIc that starts by teaching you the basics of using your system. After that, you have several choices.

One disk, The Apple At Play, paces you through six to eight short games, and another, The Apple At Work, helps you understand how the computer is useful for your personal productivity. Two other disks introduce you to two popular languages among Apple owners, BASIC and Logo. A disk entitled The Inside Story walks you through the operational mechanics of a computer with a Sherlock Holmes mystery approach.

# APPLE IIc

The products listed below were created for the Apple IIe and are compatible with the IIc. An asterisk (*) indicates that slight differences occur when the product is used with the IIc. For more information on any of these products, please circle, on the Reader Service Card in this issue of *A+*, the same number that appears in the third column below.

## COMMUNICATIONS

| | | |
|---|---|---|
| Access IIe | Apple Computer | #495 |
| ASCII Express: The Pro | Southwest Data Systems | 496 |
| DowJones News & Quotes 2.0 | Apple/Dow Jones | 497 |
| *DowJones Portfolio Evaluator | Apple/Dow Jones | 498 |
| MICRO/Terminal | MicroCom | 499 |
| P.I.T.S. | Southwestern Data Systems | 500 |
| Transend II | Transend | 501 |

## EDUCATION

| | | |
|---|---|---|
| Algebra 4 | Edu-ware | #502 |
| Algebra Arcade | Wadsworth | 503 |
| Aliencounter/Face Flash | Milliken Publishing | 504 |
| Alphabet Zoo | Spinnaker Software | 505 |
| Apple Logo | Apple Computer | 506 |
| Apple PILOT | Apple Computer | 507 |
| Apple-Super-PILOT | Apple Computer | 508 |
| Basic Building Blocks | Meca | 509 |
| Battling Bugs/Concentraction | Milliken Publishing | 510 |
| Bumble Games | The Learning Company | 511 |
| Bumble Plot | The Learning Company | 512 |
| Co-PILOT | Apple Computer | 513 |
| Computer SAT | Harcourt Brace Jovanovich | 514 |
| Crypto Cube | DesignWare | 515 |
| Elementary, My Dear Apple | Apple Computer | 516 |
| Ernie's Quiz | Apple Computer | 517 |
| Explorer Metros | Sunburst Communications | 518 |
| Facemaker | Spinnaker Software | 519 |
| Fraction Fever | Spinnaker Software | 520 |
| Fractions 3.0 | Edu-Ware | 521 |
| Frenzy/Flip Flop | Milliken Publishing | 522 |
| Game of the States | Milton Bradley | 523 |
| Gertrude's Secrets | The Learning Company | 524 |
| Gertrude's Puzzles | The Learning Company | 525 |
| Go to the Head of the Class | Milton Bradley | 526 |
| Golf Classic/Compubar | Milliken Publishing | 527 |
| GULP/Arrow Graphics | Milliken Publishing | 528 |
| Hey Diddle Diddle | Spinnaker Software | 529 |
| Hey Taxi! | Milton Bradley | 530 |
| . . . The Most Amazing Thing | Spinnaker Software | 531 |
| Instant Zoo | Apple Computer/CTW | 532 |
| Kid Writer | Spinnaker Software | 533 |
| KoalaWare | Koala Technologies | 534 |
| Look 'N Hook | The Learning Line | 535 |
| Mastering the College Board | CBS Software | 536 |
| MasterType | Lightning Software | 537 |
| Math Maze | DesignWare | 538 |
| Memory Castle | Sunburst Communications | 539 |
| Micro Division | Hayden Software | 540 |
| Micro Habitats | Reader's Digest | 541 |
| Micro Multiplication | Hayden Software | 542 |
| Micro Subtraction | Hayden Software | 543 |
| Micro Typing II | Hayden Software | 544 |
| Microzine 1.2 | Scholastic | 545 |
| Microzine 1.3 | Scholastic | 546 |
| Microzine 1.4 | Scholastic | 547 |
| Mix and Match | Apple Computer/CTW | 548 |
| Picture Writer | Scarborough | 549 |
| Police Artist | Sir-Tech | 550 |
| Puzzle Mania | Reader's Digest | 551 |
| Rhymes & Riddles | Spinnaker Software | #552 |
| Rocky's Boots | The Learning Company | 553 |
| SAT English I | Micro Lab | 554 |
| Shapes in Color | Hayden Software | 555 |
| Shell Games | Apple Computer | 556 |
| Snake-O-Nyms/Word Flip | Milliken Publishing | 557 |
| Snooper Troops I 1.0 | Spinnaker Software | 558 |
| Snooper Troops II | Spinnaker Software | 559 |
| *Speed Reading | BPI Systems | 560 |
| Speedy Spiders | Reader's Digest | 561 |
| Spellagraph | DesignWare | 562 |
| Spellakazam | DesignWare | 563 |
| Spellicopter | DesignWare | 564 |
| Spelling B Games 1.0 | Edu-Ware | 565 |
| Spotlight | Apple Computer/CTW | 566 |
| Stickybear ABC | Xerox Education | 567 |
| Stickybear Numbers | Xerox Education | 568 |
| Story Machine | Spinnaker Software | 569 |
| Story Tree | Scholastic | 570 |
| The Factory 1.0 | Sunburst Communications | 571 |
| The Jar Game/Chaos | Milliken Publishing | 572 |
| Trap-A-Zoid | DesignWare | 573 |
| Trickster Coyote | Reader's Digest | 574 |
| Typing Tutor II, 2.10 | Microsoft | 575 |
| US Constitution Tutor | Micro Lab | 576 |
| *Wizware Turtle Tracks | Scholastic | 577 |

## ENTERTAINMENT

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| A.E. | Brøderbund | #578 |
| Advanced Black Jack | Muse | 579 |
| Alien Typhoon | Brøderbund | 580 |
| Apple Cider Spider | Sierra On-Line | 581 |
| Ardy the Aardvark | Datamost | 582 |
| Argos | Datamost | 583 |
| Aztec | Datamost | 584 |
| Bandits | Sirius Software | 585 |
| Bilestoad | Datamost | 586 |
| Bop-A-Bet | Sierra On-Line | 587 |
| Borg | Sirius Software | 588 |
| Bouncing Kahungas | Penguin Software | 589 |
| Cannonball Blitz | Sierra On-Line | 590 |
| Canyon Climber | DataSoft | 591 |
| Castle Wolfenstein | Muse | 592 |
| Cavern Creatures | Datamost | 593 |
| Checkers | Odesta | 594 |
| Chess | Odesta | 595 |
| Chivalry | Xerox Education | 596 |
| Conquering Worlds | Datamost | 597 |
| Cranston Manor | Sierra On-Line | 598 |
| Critical Mass | Sirius Software | 599 |
| Crossfire | Sierra On-Line | 600 |
| Dark Crystal | Sierra On-Line | 601 |
| David's Midnight Magic | Brøderbund | 602 |
| Deadline | Infocom | 603 |
| Death in the Caribbean | Micro Lab | 604 |
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| Epoch | Sirius Software | 606 |
| Flight Simulator | SubLogic | 607 |
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| Genetic Drift | Brøderbund | 609 |
| Gorgon | Sirius Software | 610 |
| Gumball | Brøderbund | 611 |

# COMPATIBILITY CHART

BY CANDACE DE SANTIS AND JONATHAN NEHER

| | | |
|---|---|---|
| Infidel | Infocom | #612 |
| King Cribbage | Hayden Software | 613 |
| Knight of Diamonds | Sir-Tech | 614 |
| Lafpak | Sierra On-Line | 615 |
| Lancaster | Silicon Valley System | 616 |
| Legacy of Llylgamyn | Sir-Tech | 617 |
| Lemmings | Sirius Software | 618 |
| Lode Runner | Brøderbund | 619 |
| Marauder | Sierra On-Line | 620 |
| Mating Zone | Datamost | 621 |
| Microsoft Decathlon | Microsoft | 622 |
| Minit Man | Penguin Software | 623 |
| Missile Defense | Sierra On-Line | 624 |
| Mission Asteroid | Sierra On-Line | 625 |
| Monster Smash | Datamost | 626 |
| Mystery House | Sierra On-Line | 627 |
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| One on One | Electronic Arts | 630 |
| Outpost | Sirius Software | 631 |
| Pegasus II | Sierra On-Line | 632 |
| Pensate | Penguin Software | 633 |
| Phantom's Five | Sirius Software | 634 |
| Pie-man | Penguin Software | 635 |
| Prisoner 2 | Edu-Ware | 636 |
| Pulsar | Sirius Software | 637 |
| Repton | Sirius Software | 638 |
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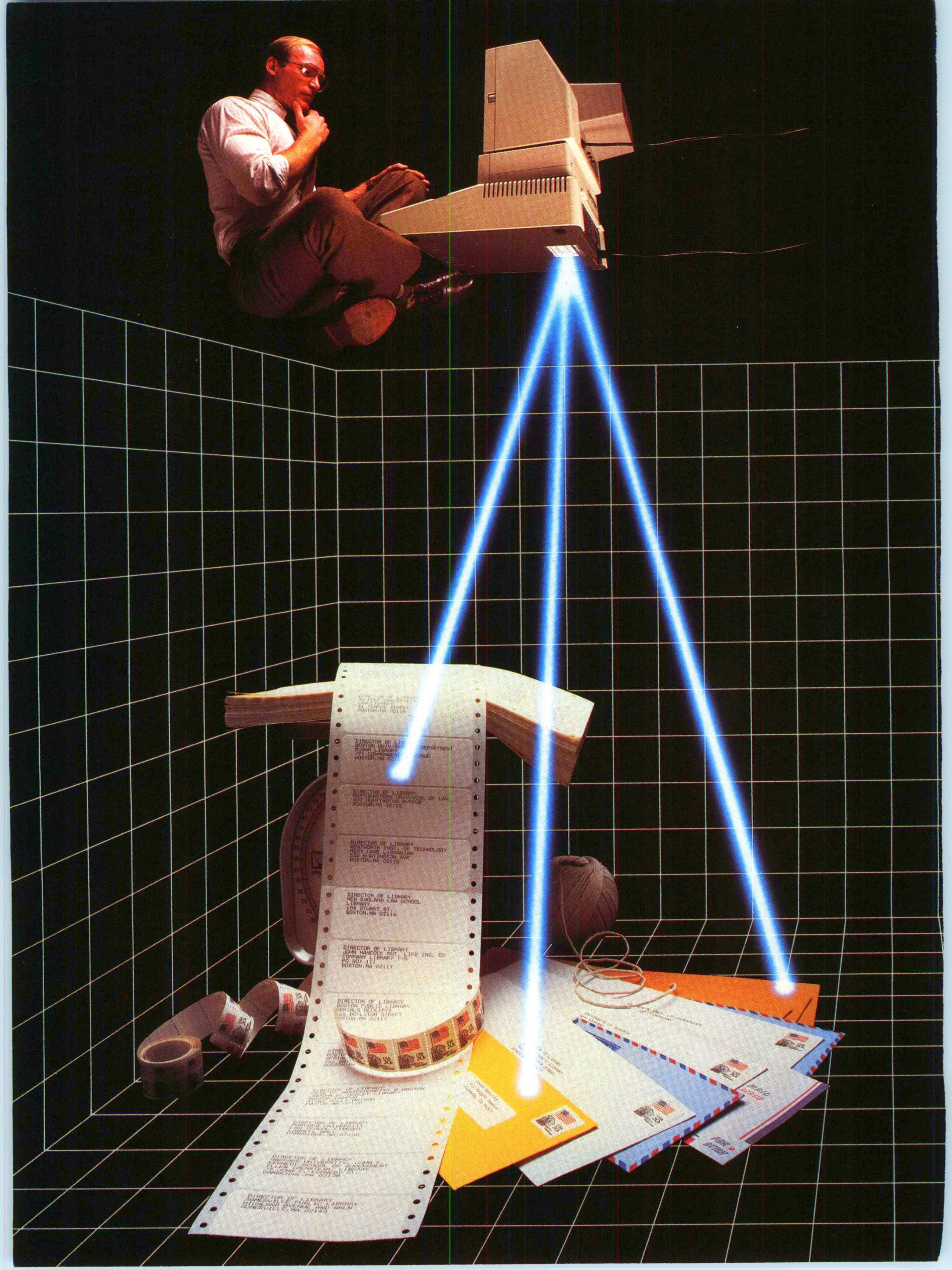
| Sammy Lightfoot | Sierra On-Line | 640 |
| Sargon II | Hayden Software | 641 |
| Seafox | Brøderbund | 642 |
| Serpentine | Brøderbund | 643 |
| Sky Blazer | Brøderbund | 644 |
| Snack Attack | Datamost | 645 |
| Snake Byte | Sirius Software | 646 |
| Sneakers | Sirius Software | 647 |
| Space Ark | Datamost | 648 |
| Space Quarks | Brøderbund | 649 |
| Spare Change | Brøderbund | 650 |
| Spectre | Datamost | 651 |
| Spy's Demise | Penguin Software | 652 |
| Super Bunny | Datamost | 653 |
| Suspended | Infocom | 654 |
| Swashbuckler | Datamost | 655 |
| Temple of Apshai | Epyx/Automated Simulations | 656 |
| The Arcade Machine | Brøderbund | 657 |
| The Coveted Mirror | Penguin Software | 658 |
| The Missing Ring | Datamost | 659 |
| The Sands of Egypt | DataSoft | 660 |
| The Warp Factor | Strategic Simulation | 661 |
| Titan Empire | Muse | 662 |
| Tubeway | Datamost | 663 |
| Ultima II | Sierra On-Line | 664 |
| Ulysses | Sierra On-Line | 665 |
| Wizard and the Princess | Sierra On-Line | 666 |
| Wizardry | Sir-Tech | 667 |
| Wizplus | Datamost | 668 |
| Zaxxon | DataSoft | 669 |
| Zork I | Infocom | 670 |
| Zork II | Infocom | 671 |
| Zork III | Infocom | 672 |

## PRODUCTIVITY

| | | |
|---|---|---|
| Apple II Business Graphics | Apple Computer | #673 |
| *Apple Writer IIe | Apple Computer | 674 |
| *Apple Writer IIe PTP | Apple Computer | 675 |
| *Apple Writer II | Apple Computer | 676 |
| Apple Writer II PTP | Apple Computer | 677 |
| Bank Street Writer | Brøderbund | 678 |
| BPI Accounts Payable II+ | BPI Systems | 679 |
| BPI Accounts Receivable | BPI Systems | 680 |
| BPI Accounts Receivable II+ | BPI Systems | 681 |
| BPI Business Analyst | BPI Systems | 682 |
| BPI General Accounting II+ | BPI Systems | 683 |
| BPI General Accounting | BPI Systems | 684 |
| BPI Inventory Control II+ | BPI Systems | 685 |
| BPI Job Cost II+ | BPI Systems | 686 |
| BPI Payroll II+ | BPI Systems | 687 |
| Desk Top Planner | VisiCorp | 688 |
| General Manager II | Sierra On-Line | 689 |
| Home Accountant | Continental Software | 690 |
| HomeWord | Sierra On-Line | 691 |
| *Incredible Jack 1.3 | Business Solutions | 692 |
| Magic Window II | Artsci | 693 |
| Personal Tax Planner | Aardvark | 694 |
| Personal Tax Planner | Aardvark/Apple Computer | 695 |
| *Quick File IIe | Apple Computer | 696 |
| *Quick File IIe PTP | Apple Computer | 697 |
| Real Estate Analyzer II | Howard Software | 698 |
| Senior Analyst | Apple Computer | 699 |
| Super Text Home/Office | Muse | 700 |
| Super Text Pro (40/80) | Muse | 701 |
| Tax Manager | Micro Lab | 702 |
| The Tax Advantage | Continental Software | 703 |
| VersaForm | Applied Software Technology | 704 |
| VisiSchedule, 1.1 | VisiCorp | 705 |
| VisiTerm, 1.2 | VisiCorp | 706 |
| VisiTrend, 1.1 | VisiCorp | 707 |

## UTILITY

| | | |
|---|---|---|
| Alpha Plot | Beagle Bros. | #708 |
| *Apple FORTRAN | Apple Computer | 709 |
| Apple Graphics II | Apple Computer | 710 |
| Apple Mechanic | Beagle Bros. | 711 |
| *Apple Pascal II, 1.1 | Apple Computer | 712 |
| Beagle Bag | Beagle Bros. | 713 |
| DOS Boss | Beagle Bros. | 714 |
| DOS Tool Kit | Apple Computer | 715 |
| *DOS Tool Kit/Applesoft | Apple Computer | 716 |
| Expediter | Sierra On-Line | 717 |
| EZ Draw | Sirius Software | 718 |
| *NPL IIe | Apple Computer | 719 |
| Pascal II 1.2 | Apple Computer | 720 |
| ProDOS 1.0 Applesoft Sampler | Apple Computer | 721 |
| *ProDOS 1.0 BASIC Programming Examples | Apple Computer | 722 |
| *ProDOS 1.0 Development System/Tool Kit | Apple Computer | 723 |
| Pronto DOS | Beagle Bros. | 724 |
| Script II | Apple Computer | 725 |
| Utility City | Beagle Bros. | 726 |


DIRECTOR OF LIBRARY
NORTHEASTERN UNIV/SCH. OF LAW
400 HUNTINGTON AVENUE
BOSTON,MA 02115
DIRECTOR OF LIBRARY
WENTWORTH INST. OF TECHNOLOGY
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PAR AVION

# FOUR WAYS TO MANAGE YOUR MAILING LIST

**With the right mailing-list program, your Apple computer can save you hours of work.**

A small-computer system, such as an Apple, can benefit a small business in many ways. Accounting and word processing are two of the most popular applications. When it comes to managing lists of data, such as files of customers' names and addresses, the Apple can do some things that would be almost impossible without a computer's help.

Whether you are dealing with the membership of a civic group or a church or the mailing list of a retail store, using an Apple can save hours of work.

Processing a list of names and addresses is easy if you select the right program. Most mailing-list programs are actually database managers, programs that store information on disk and recall it as required. You can often use a general-purpose database program to process a mailing list with good results.

Specially designed mailing-list programs, although still a form of database, include features specifically designed to handle names and addresses. These packages usually leave out features that are unimportant to mailing lists, emphasizing flexibility and easy operation instead.

**Three Main Features**

No matter which kind of program you use for your mailing lists, it must have three main features: (1) some means of entering (and deleting) names and addresses, (2) a method of printing lists and mailing labels, and (3) a way to sort the list when you need to.

A small mailing list makes fewer demands on a system than does a larger one, both in storage space and the time for processing information. A program that works well with 50 names may be useless with 1000, and one meant for a large list may be needlessly complex for use with a small number of names.

I had the opportunity to use four different programs to work on mailing lists for a few weeks and discovered several differences and a few surprises. The programs I used were Apple's Quick File II and PFS:File from Software Publishing Corporation, which are general-purpose database programs, and Continental Software's FCM and Mail Manager from Craftsbury Software, which are specifically designed to process mailing lists.

**FCM**

FCM, from Continental Software, is designed as a mailing-list program, although you can modify it and use it for other tasks as well.

When setting the system up for the first time, you specify the kind of printer you are using, and FCM takes full advantage of any special features it may have.

My printer is an Epson, and FCM is able to turn its compressed-print format on and off as required. FCM also notes the printer slot, the type of interface, and the number of disk drives in your system. Once you've entered this information, the setup procedure is over, and you are ready to go to work.

Entering names into FCM is fast and easy; the program displays prompts along the way, and you won't have any problem correcting a mistake. If you use FCM with no modifications, you enter first name, last name, company, address, city, state, and ZIP code. You also have room for a telephone number and two "special" fields which you can use for whatever you choose. For example, you can use one for a spouse's name and another for date of birth or perhaps date of last purchase. Each entry (record) can contain 12 categories, and each category (field) within a record can hold 24 characters.

When a record is complete and you've made any corrections, you can record it onto disk, cancel it altogether, or send the record to your printer for a hard copy. When you enter many names, the program activates the disk

RICHARD BELCHER

drive every two or three entries, requiring a short wait. This method of recording names a group at a time allows for rapid data entry.

FCM limits you to 750 records per disk, but you can manage much larger files by using multiple data disks and swapping them.

You can rename or eliminate any of the fields and adjust their lengths to your needs. If, for instance, you choose not to use the Company field, you can set it to inactive status and use the 20 characters allotted to that field in some other part of the form.

Using a mailing-list program involves more than just entering names. You must have some way to sort the names, select specific records, and print the results. Since FCM is designed specifically for handling mailing lists, it does a good job with these functions as well.

When you sort with FCM, it creates a new version on the data disk of the file you are sorting, arranged according to your needs—perhaps ZIP-code order or with alphabetized last names.

The program gives you several different formats for printing out your lists. One option is to print an entire list, in either a vertical or horizontal layout. You can also print a selected part of a master list. If you need a list of customers living in Texas, specify TX as the state, and the program will select only the appropriate entries.

Like all good mailing-list programs, FCM allows you to print mailing labels. You can print one to three labels across, change the print format, and even print labels in a particular order. You can include a message of your own on each label, so the program is well suited for direct-mail advertising.

FCM also provides a Print Envelopes option, which prints the address in the center of the envelope and puts your return address in the upper left corner. Continuous-form envelopes can simplify use of this feature and allows the job to run unattended.

You can combine the names on your mailing list with letters you create with a word processor to produce customized form letters. FCM's Form Letter routine puts a person's name in the greeting of a letter, giving a personal touch to your mailing.

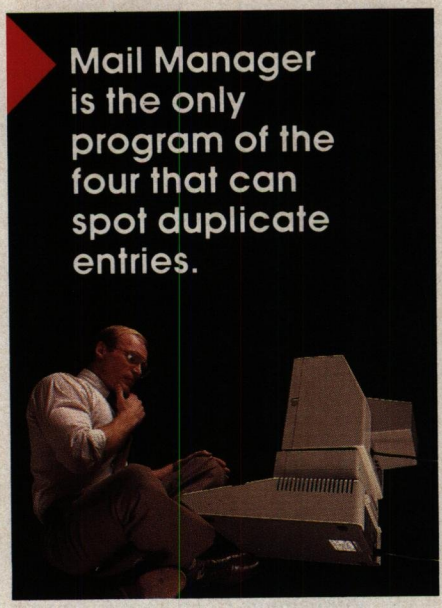
The manual that comes with this program is thorough and easy to read, but FCM is so simple to operate that you may never need documentation after the first day. Continental Software provides a customer-service telephone line, but getting through is difficult. The line is almost always busy, and the technical-support staff seems a bit rushed.

At $99.95, FCM is a good value and offers almost everything you need to handle a mailing list efficiently. It would be a good choice for most applications.

**Mail Manager**

Like FCM, Mail Manager, from Craftsbury Software, is designed specifically for one task, mailing lists. It offers some features that the other three programs lack.

One interesting aspect of Mail Manager is its way of maximizing disk-storage space. Names and addresses in mailing lists rarely occupy all of the space set aside for them. Mail Manager lets you specify a slightly smaller maximum length for each record. Most records have enough unused characters to make this system very helpful. In fact, I was able to increase the maximum number of records per disk from 850 to 1000, simply by specifying a smaller maximum record size.




Mail Manager is the only program of the four that can spot duplicate entries. If a new record is close enough to another in both name and address, the program will notify you and let you choose to add the new one or cancel the record.

With Mail Manager you can print one to four labels across a single sheet. The names can appear in any order, and you can include as much information as you want with each. The program also lets you include up to five lines of text, such as a seasonal greeting or advertising message, anywhere on the label.

Getting Mail Manager ready to run is more involved than setting up the other programs. You must prepare data disks as well as a "utility" disk, which holds such information as form design and print instructions. You have to swap this utility disk with the main program disk several times during operation—a rather time-consuming task. Even with a two-drive system, three swaps are necessary before you can print data.

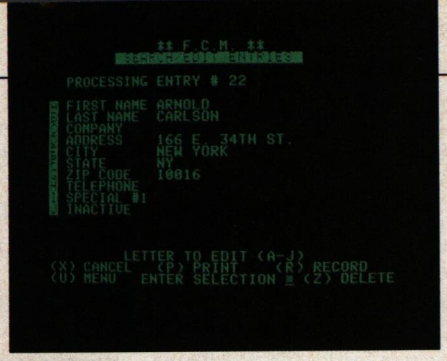
The biggest drawback of this program is its speed—or rather the lack of it. With Mail Manager, you'll need an inordinately long time to enter names. Even for a fast typist, entering each name and address takes up to 45 seconds, with the bulk of the time going for writing each entry on the diskette. Although this may not seem like a long wait, the time quickly mounts up when you're dealing with a large number of records. Even entering my 100-name test mailing list was much too time-consuming to do in one sitting.

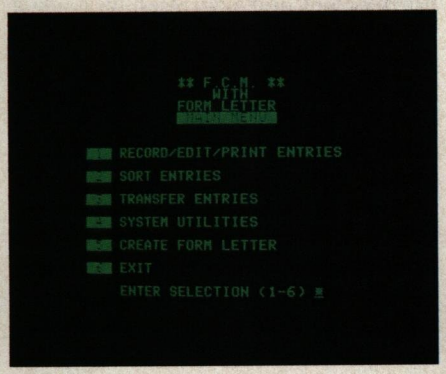
An odd program quirk came up while I was entering one of the names on my list—for some reason, Mail Manager would not accept the name O'Brien. I later learned that the program allows only the letters A–Z for the first two characters in a name. In order to get the name O'Brien into the file, I had to enter it as OBrien, which was accepted as a valid entry, although it looked somewhat strange when it was printed out.

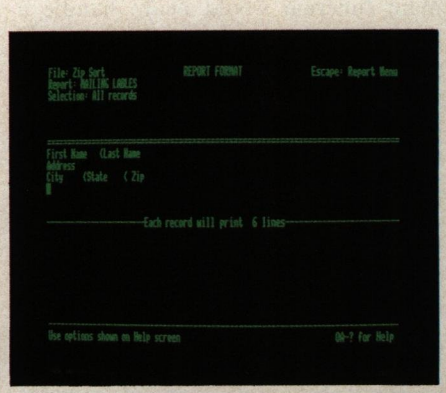
Craftsbury Software chose a method of writing to disk that, although it's slow, almost eliminates the possibility of losing a piece of data. Each time you enter a new record, the program opens the disk file, adds the new data, and closes the file. This way, the computer could lose power or be shut off any time, and the worst consequence would be the loss of a single record.

Mail Manager's manual could stand some improvement; not only is it a bit hard to follow, but the dot-matrix typeface also makes it hard on the eyes. Nonetheless, Craftsbury Software provides a degree of customer support rare in business-software companies. The firm is small enough that you can pick up your phone and speak to the program's designer, should you have a problem operating the system.

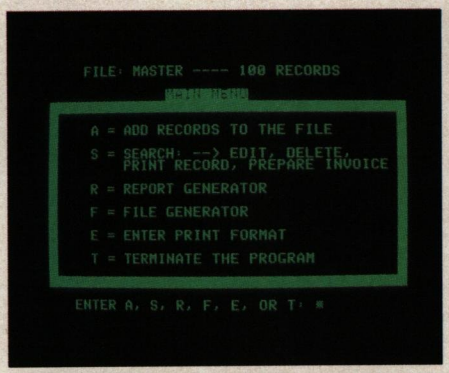
This $89 package includes a basic word-processing program at no additional charge. You can easily create personalized form letters by merging your mailing list with files from the word processor.

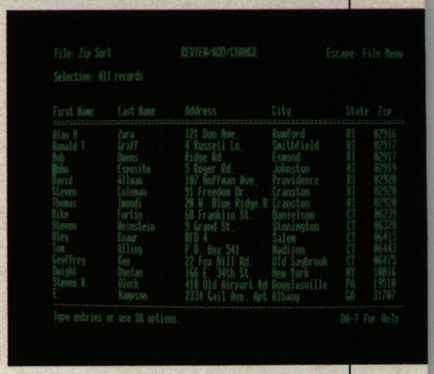


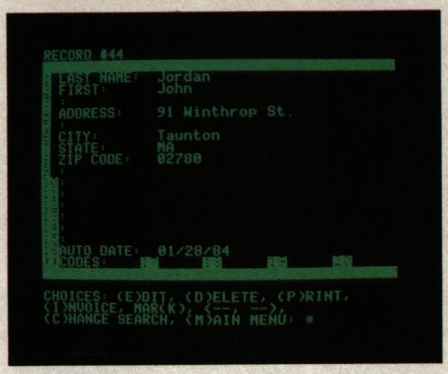




*Two sample displays from tested mailing programs: Continental Software's FCM (above and left), Craftsbury Software's Mail Manager (below) and Apple's Quick File II (right).*




It is unfortunate that a program that is so effective at maximizing storage space suffers from such serious speed limitations. Should a faster version of this program come along, it would be a serious contender in the mailing-list sweepstakes.

**PFS:File**

Unlike the first two programs, PFS:File from Software Publishing Corporation, was not specifically written to handle mailing lists. The package was designed as a general-purpose filing and cataloging system that can help with many different tasks. So that you can easily adapt the program to your needs, the manufacturers also market a series of software diskettes that tailor it to specific applications. One such disk, called Mail List, includes routines that help you use PFS:File as a mailing-list system.

The PFS: system has some unusual features. Most striking is the way you enter data and the program's method of executing commands. The designers chose to use Control-C, instead of Return, to make PFS:File process most commands. For example, in order to select function 5 (Print) from the main menu, you must enter the number 5 and press Control-C before anything will happen. If you enter 5 and press Return, as habit is bound to dictate, not only will the command remain unexecuted, but the cursor will also zip away to the left of the screen for no apparent reason other than to punish you further.

You need an Apple IIe to operate PFS:File, yet the program does not seem to use the machine to its fullest potential. One example is the IIe's Delete key; correcting mistakes would have been easy with this key, but for some reason the program's designers chose not to use it. In fact, deleting a mistake can be difficult with PFS:File. If you type the name Smith as Smithh, you have no simple way to erase the extra *h*. You must backspace over the offending letter and press the space bar—an unnecessary step not found in the other programs.

The Mail List diskette that came with my test copy of PFS:File contained a ready-to-run form for entering records, but you don't have to have it to use the system. Actually, I was able to design a form more to my liking with little effort and could easily have managed without this optional disk.

Entering names with PFS:File is an easy job as soon as you get used to using Control-C rather than return at the end of each record. Any time during operation, pressing the Escape key returns you to the main system menu, where you can select Print, Delete, Add, Copy, or any other function.

PFS:File can print mailing labels, but it allows no more than one across. Setting the label printing to your needs is easy; simply choose the items you want to include and specify whether you want the list sorted or not. For example, marking the ZIP-code field with an S instructs the program to print in ascending ZIP-code order.

Printed labels can use data fields only in the order in which they appear in the files themselves. If you want labels with the last name first and the first name last, the data must be in the same order.

The program's manual is thorough and nicely produced. The only fault in the documentation is that the illustrations of screen displays are difficult to read. In fact, this program challenges eyesight in many different ways. In addition to the manual's illustrations, another eyestraining aspect of the program is that the screen often displays data in an inverse, 80-column format—very hard on the eyes.

If you already have a copy of PFS:File that you are using for data management, you can consider adapting it to your mailing-list needs as well. If I were selecting a program whose main function would be to handle a mailing list, however, PFS:File would not be my first choice. Many of the same functions that make PFS:File a good choice as a database system tend to limit its performance in an application such as this.

PFS:File is the most expensive of the four packages ($125 plus $20 for the Mail List diskette), which would be a negative factor even if its performance were equal to that of the others.

**Quick File II**

Every now and then, a program comes along that I fall in love with, the first time I use it. Quick File II from Apple is one of them. From the moment I opened the package, I felt comfortable with Quick File and had the system down pat in no time at all.

To operate Quick File II, you need an Apple IIe. All of the IIe's special features, such as the Tab key, the open- and closed-apple keys, and the four arrow keys, make the system easy to learn and simple to operate. One example is a help function; press the open-apple and ?, and a full screen of explanatory information appears almost immediately. A tap of another key brings a new screen of explanations, covering every command and function. Any time you run into a problem, use the Help command, and you'll soon have the answer.

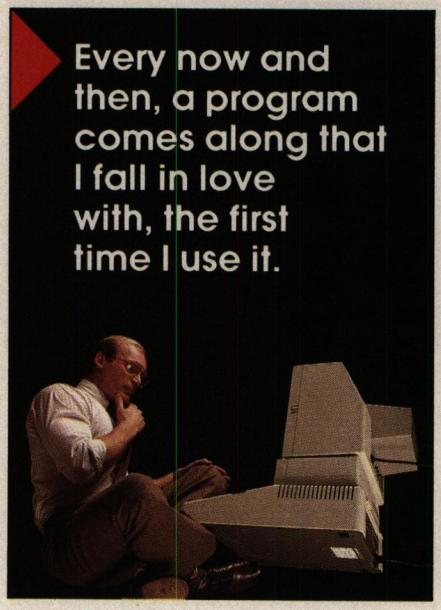
Twenty-five different entries can appear on the screen at the same time. The arrow keys let you scroll up and down through the entire list or jump directly to a specific record. Anywhere in the list, you can insert a new record or modify or delete an existing one. The program transfers any changes you make to the display on the screen to the data file when you are finished.

Rather than using Control-key commands, Quick File II uses the open-apple key in conjunction with various other keys to do the bulk of the work. For example, with the cursor on a particular record, holding the open apple and pressing Z "zooms" in on that record and shows all of the information pertaining to it. Pressing D with the open-apple key deletes a record, P prints the screen, and so on.

With Quick File II, you don't have to worry about getting in trouble. The Escape key can undo just about every mistake you make and bring you out of an incorrectly selected function. During all operations, a display in the corner of the screen shows what will happen if you press the Escape key at that time. In the Add/Review/Change function, for example, pressing Escape returns you to the File menu, ready to save the file or choose another.

Quick File II's system of handling data differs from that of the other three programs. You can load a file completely into memory and manipulate it; the others generally leave the information on disk, loading only what you need at any one time. With the data in RAM, Quick File has a distinct speed advantage over the others. In some cases, such as in the Sort function, the difference is dramatic.

Designing a printed label is as easy as it can be. The names of the different fields appear on the screen, and you move them (with the help of the arrow keys) to the position you want. A left-justify option makes sure that the final printout looks professional, with, for example, the last name immediately following the first rather than having a number of intervening spaces.




Quick File II has one of the finest manuals I have ever read. Everything is presented in a concise manner with illustrations to guide you. A disk of sample files gives you some practice with the system.

Nobody knows Apple like Apple, and the company proves it with this program. It is lightning fast, almost impossible to operate incorrectly, and extremely versatile.

Although it is not the best choice for use with a large mailing list, Quick File II is such a delightful program in every other respect that I can recommend it for anyone with a relatively small list. The maximum number of records with a standard Apple IIe is somewhere between 150 and 250. If you are using an extended 80-column card, the additional 64K of memory allows up to 700 records.

You will find plenty of things for Quick File II to do in addition to handling names and addresses. It is ideal for all types of general recordkeeping and storage. Unlike many other data-storage and -retrieval systems, Quick File makes accessing information easy enough to warrant its use.

**Comparative Tests**

Because of the different ways in which these programs sort and select data, testing them objectively on speed and performance was difficult. I did, however, run each of the programs through some tests in order to judge their ability to print and sort a sample mailing.

I entered a name-and-address list with 100 records into each of the four systems and measured the time each required to sort this list by ZIP code and to print 100 mailing labels.

Since it holds the entire list in memory, Apple's Quick File II was the hands-down winner in sort time. After you give the command, the program presents you with a finished product in only seven seconds. The closest challenge came from FCM, which sorted the list and wrote the results onto disk in just under two minutes. Mail Manager took a full two mintues just to read the entries from disk, but it performed the actual sort in a fraction of a second.

PFS:File sorts during the printing process, so it is difficult to make a direct comparison with the other programs for this task.

Printing the sorted file onto 100 continuous-form labels was the second part of my test. Here as well, Apple's Quick File II took the checkered flag with a print time of 2 minutes, 55 seconds. PFS:File sorted and printed the list in an admirable 3 minutes, 30 seconds; the times FCM and Mail Manager required were 6 minutes, 45 seconds and 7 minutes, 13 seconds, respectively.

Each of the four systems has advantages and drawbacks of its own. For example, in some applications, the benefit of the duplicate-record detection in Mail Manager may outweigh the program's speed limitations. Depending on the size of your mailing list and the amount of information you must store in each record, you should select the program best suited to your needs.

If your list is small and not likely ever to exceed a few hundred names and addresses, Quick File II would be my recommendation. This program was unequaled in ease of use and flexibility; storage capacity was its only limitation.

For a larger list, FCM from Continental Software seems to be the logical choice. If you use multiple data diskettes, your mailing list can grow as large as you wish.

The computer system you are using can have some bearing on the choice as well. Both Quick File and PFS:File require an Apple IIe, and FCM and Mail Manager operate equally well on an Apple II Plus. The four programs are in the same general price range, from a low of $89.95 for Mail Manager to PFS:File's $125 retail. They are all reputable products and worthy of your consideration when you're choosing a mailing-list program. +

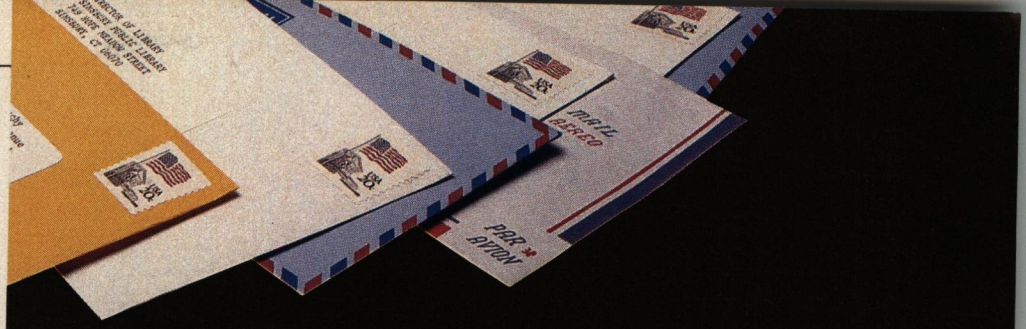
## ▸ PRODUCT INFORMATION

**FCM**
Continental Software Company
11223 South Hindry Avenue
Los Angeles, CA 90045
(213) 417-3003
**List Price:** $99.95
**Requires:** Apple II, II Plus, or IIe; 48K RAM; one disk drive (two drives to use all functions)

**Mail Manager**
Craftsbury Software, Inc.
1623 Montague Street, N.W.
Washington, DC 20011
(202) 829-3121
**List Price:** $89.95
**Requires:** Apple II Plus or IIe, 48K RAM, one disk drive

**PFS:File**
Software Publishing Corporation
1901 Landings Drive
Mt. View, CA 94043
(415) 962-8910
**List Price:** $125; optional Mail List diskette, $20
**Requires:** Apple IIe, 64K RAM, one disk drive (two drives to use all functions); 80-column text card to use Mail List diskette.

**Quick File II**
Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
**List Price:** $100
**Requires:** Apple IIe, 64K RAM, two disk drives



# SPECIAL POSTAL RATES

The U.S. Postal Service's 20¢ charge for delivering a piece of mail to any part of the country is a rare bargain nowadays. When the mail you're sending is not one piece but hundreds or thousands, however, 20¢ per piece can add up to a serious investment.

Most of us use first-class postage on everything we send; when we're mailing small quantities, we have no option. Large companies and advertising services can save thousands of dollars in postage when they send a mailing by using third-class/bulk rate, with which the charge for each piece is only 11¢. Nonprofit organizations save even more; their bulk-mailing rate is 5.2¢ per piece, a far cry from the 20¢ charge for first class. Not only is third-class postage less expensive, but the maximum weight for each piece also increases from one ounce to almost four (3.97, to be exact).

Each mailing must contain at least 200 pieces, and bulk-rate mail takes somewhat longer to arrive than first-class, but the savings can easily outweigh the drawbacks. All-in-all, bulk-rate mailings make a lot of financial sense.

This mailing method sounds fine, but you cannot simply buy "third-class" stamps and stick them on your letter—mass mailing involves a few steps, and the computer makes many of them easy.

First, you must apply for a bulk-mailing permit from your post office. There you'll get a permit number that must appear on each piece you send. You should do this well in advance, in order to have the information ready for the printer who is preparing your mailing. Another option is to get an inexpensive rubber stamp with your permit number and stamp it on each piece.

Next, you have to sort and bundle the mailing by state, city, and ZIP code. This procedure saves the post office much of the trouble involved in handling mail and accounts for the discount rate. Here is where your computer can be a big help. A sort function can arrange your mailing list by ZIP code, and you can print and apply labels in that order.

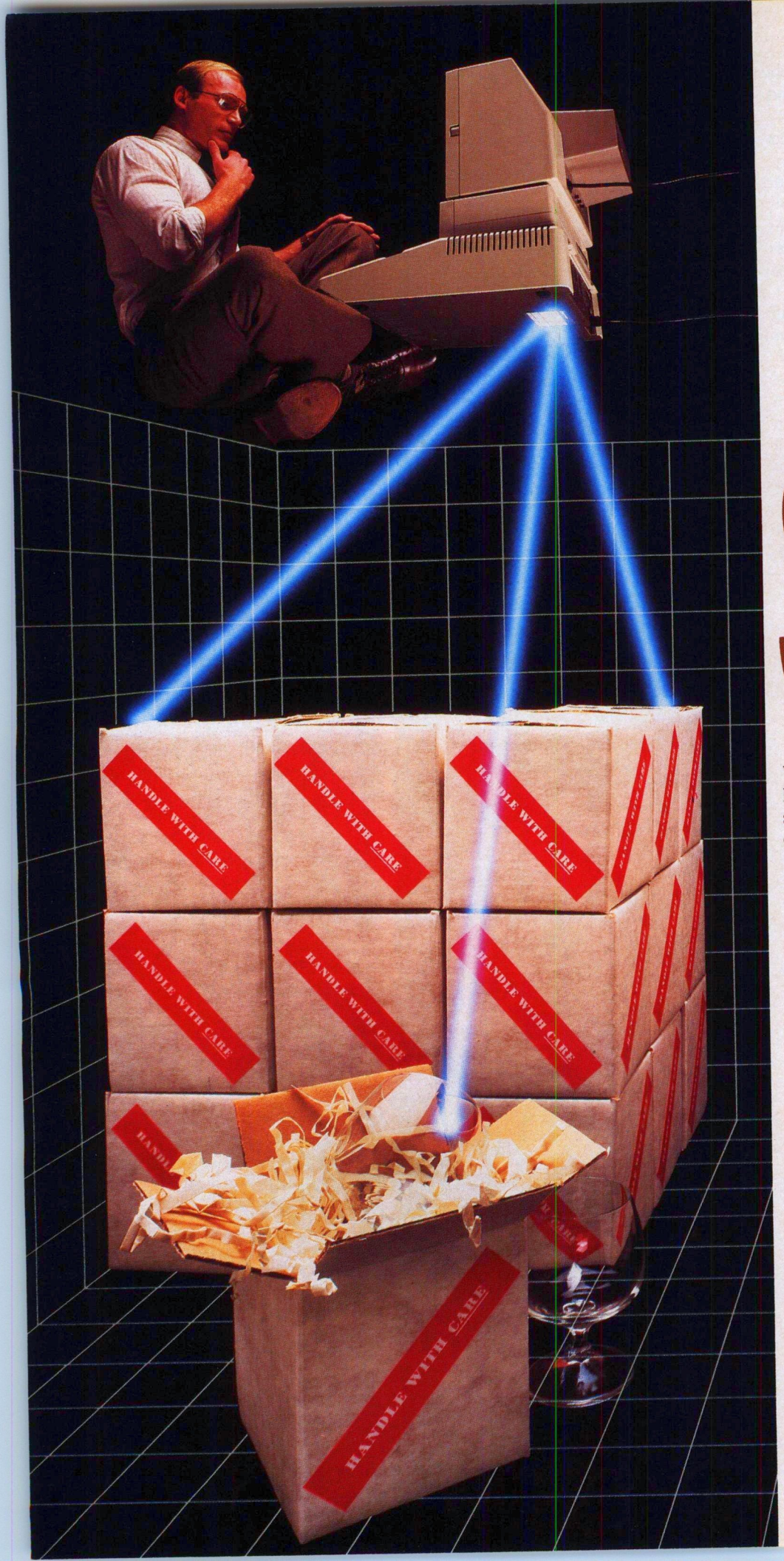
Whenever ten or more pieces are going to the same five-digit ZIP code, you have to bundle them into what the Postal Service calls "five-digit packages." You bundle groups of these going to the same main post office again into "city" packages. Further steps involve bundling by three-digit ZIP code prefix, regional postal facility, and state.

Once you've bundled them, you must code these packages by means of small stickers affixed to the top of the stack. In the case of a package going to the same five-digit zip, the label is a red D; for a city package, it is a yellow C. You may have seen these coding labels on a piece of mail delivered to your house, if that piece happened to be on the top of a bulk-mailed stack.

Once everything is ready, you cannot simply drop it all into the corner mailbox; you must bring the mailing directly to the post office that issued the permit. Not all post offices are equipped to handle bulk mail, but every major city has at least one that provides bulk-mailing service.

The post office will provide most of what you need to prepare a mailing, such as coding stickers and mail sacks for very large mailings. Postal Service personnel can also answer any questions about third-class bulk-mail procedures.

This process may seem like a lot of work, but the difference between a $200 postage charge to send 1000 pieces first class and $110 for bulk rate can pay for a mailing-list program with just one mailing. With a 10,000-piece mailing, the savings is $900. Depending on the size of your list, the amount you save may even pay for your entire computer system!




# MANAGING INVENTORY MEANS TAKING STO

What do a Minnesota electronic publishing company, a chain of waterbed stores in Arkansas, and an urban school district in Texas have in common? Two things—large databases to manage and Apples to manage them.

Randy Irwin runs nine Bar and Bedroom stores in Little Rock, Hot Springs, Jacksonville, Pine Bluff, and other Arkansas cities. His inventories cover everything from bar glasses to bedroom suites, as many as 20,000 pieces of up to 500 items.

"Without the computers," Irwin says, "I'd have to physically count every one of many thousands of items, maybe as often as every week. With the computers, we still count periodically, but much less frequently. And, more important, we always know where our inventory stands. When you can never put your finger on exactly how much you have of each item, you're forced to buy more to make sure you're covered, and that takes more capital. With the Apples, we're in control; we never have to worry about being over- or understocked. That's been the 'money difference' for us in the six years we've been using Apples in the business."

The heart of Irwin's complex system is an Apple III with a five-megabyte ProFile hard-disk drive and software

# OCK

**Three businesses—in Minnesota, Arkansas, and Texas—swear by Apples for managing their databases.**

from Great Plains Software of Fargo, North Dakota. The workhorses at each of his nine stores are Apple II Plus computers running a modified version of Apple's Cashier program for inventory control. He doesn't need any specially trained data-processing personnel to keep the system going.

Salespeople at each store update the database themselves. "All they have to do is enter their sale, and the computer does the rest," says Irwin. "The Apple is plenty of machine for the kind of business inventory I do. The program is very simple and straightforward, and it takes one day to train personnel to be productive on it. The lack of a ten-key pad on the Apples is no drawback at all, especially since the people using my system are salespeople, without secretarial skills."

With the Apple III, Irwin has been using Great Plains' Inventory and Point of Sale software, with excellent results. "Maybe I've just been lucky," he says, but I spent a lot of time shopping for the right software for the Apple III, and this package has been spectacular. I've had no problems with it in a year of use."

Now, like the rest of us, Irwin is excited about the newest Apple of all, the Macintosh, but he's also intrigued by the new ProDOS operating system, which makes it possible to use a hard disk with the Apple II family of computers.

"If I were starting out in business today," he muses, "that's probably the system I would go with. I like the Apple II Plus as it is, but a hard disk gives users quicker access to information and allows everything to work together. It really simplifies the handling of large amounts of information, especially for people who are not trained to use computers, because with it, you don't have to keep swapping out floppy disks. That can be a bit of a problem when your database covers several disks."

Even though the number of items Irwin inventories is relatively small, he must keep large quantities of each item on hand. "My system might not be suitable for something like an automotive-parts warehouse, where they have 20,000 items but only one or two of each; but for what I use it for, it's perfect.

"In fact," he concludes, "unless a business has a really huge number of items, say something over 5000, the Apple is more than enough machine."

**Books on Apples**

Even 5000 items don't daunt the administration of the Hurst-Euless-Bedford Independent School District just northeast of Fort Worth, Texas. That's how many library books they've been keeping track of, using Apple IIs and a customized program especially for library systems.

"We evaluated DB Master by Stoneware Microcomputer Products for handling this database," says Bill Michael, the district's microcomputer consultant. "It wouldn't have been a bad choice, but we decided on the specialized library software because it has additional features, such as the ability to print card catalogs and work directly through bar codes on the books, for tracking their whereabouts."

Besides the book inventory, HEB controls an enormous inventory of sheet music. Each of the 27 schools, which together serve a total of 17,000 students, maintains a sheet-music inventory on its individual Apple, using DB Master. "Then," says Michael, "we consolidate them to get a district-wide inventory of thousands of pieces. We always know where every piece is at any given time.

"I never worry about capacity," he continues. "DB Master can handle over 380,000 records, if you've got enough floppy disks to store them on."

**Apples Track Apples**

Another inventory the school district is finding indispensable is the one that keeps track of all the Apples it is using for a wide range of applications throughout the system. In the classrooms, students are learning everything from math to French to vocational business skills from Apple II Plus and IIe computers—215 of them at the moment, with some 300 more recently approved by the school board. The superintendent's secretary, a veteran Apple II user, is proudly using a brand-new Macintosh for word processing, after only about half an hour's instruction from Michael. Another Macintosh graces the business office; its user graduated from an electric typewriter to MacWrite word processing in only a day or two, virtually without training,

except for the tutorial, "A Guided Tour of Macintosh," that comes with the program.

Also in the works is a broadband cable network that will allow point-to-point communication among the district's hundreds of Apples, as well as with the central minicomputer, a Hewlett-Packard 3000, which the administration uses for such applications as payroll, student records, and textbook records.

"We're using the Apple II to keep track of all these Apples," says Michael—"which school has which piece of equipment, whom we bought it from, what we paid for it, who has responsibility for it now, what repairs it's had, and so forth."

How do the teachers, librarians, and secretaries feel about using Apples for so many diverse applications? The HEB Research and Development department, under the direction of Ronnie Banner, has eased the schools' transition into the information age by providing extensive and ongoing training for teachers as well as administrative personnel. "We don't have a mandate that you *will* use computers in your classroom, whether you like it or not," Michael explains. "But we've had great success at getting the teachers interested in using the Apples, especially when they see their peers doing so. They don't want to be left behind. Of the 215 Apples we have in place, I don't know of any that are sitting in the closet unused."

**Database Publishing**

Lack of use isn't a problem for Daniel Kingman of Corporate Intelligence, Inc. in Minnesota, either. His database-publishing company puts a lot of mileage on its four Apple II Plus machines and one IIe. "We've created some 350,000 records on our Apples, and we're adding 10,000–12,000 a month," Kingman says.

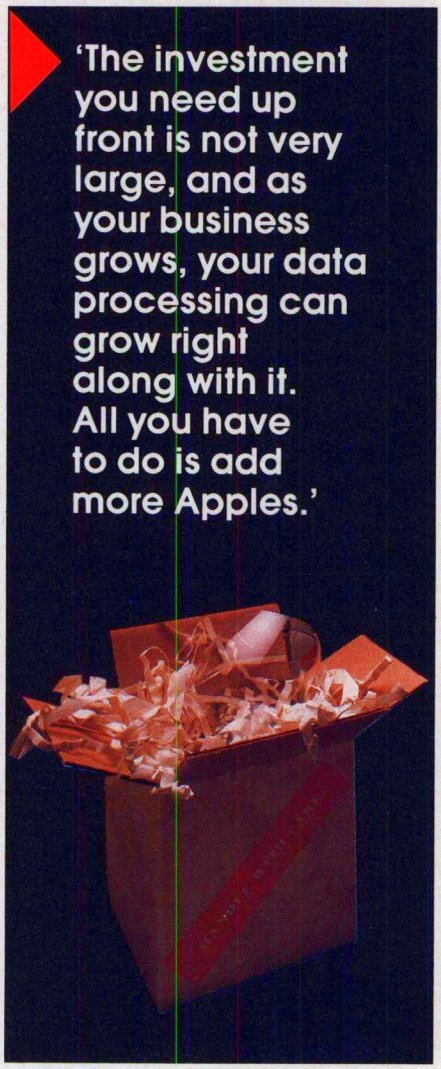
Electronic publishing is Kingman's business. The trained professionals on his staff analyze advertisements appearing in over 100 popular consumer and business magazines, enter their analyses onto floppy disks, and transfer the information onto tape that can be read by a mainframe computer, which then makes it available to computer users in 27 different countries.

The thousands and thousands of words that Kingman and his staff generate never assume printed form, except on a computer screen. That's all right with his subscribers, who access the information he provides via a computer information utility called Dialog Information Retrieval Service. The database Kingman publishes, called ADTRACK, provides vital information to magazine publishers, advertisers, news services, attorneys—anyone who needs to analyze who's advertising what, and how, in which consumer and business magazines.

Among them are the world's major advertising agencies, as well as companies such as CBS News and *Newsweek*. "The only real alternative to our service," Kingman says, "is to sit down with a stack of a hundred or so magazines, and flip through them page by page.

"Of course, we don't search our own data on the Apples here at Corporate Intelligence; you need an enormous computer to do that. But through Dialog, we're able to be *the* major publisher of on-line advertising information."

The program that runs on the Apples and enables the company to generate all this information is one that Kingman designed, wrote, and installed himself.



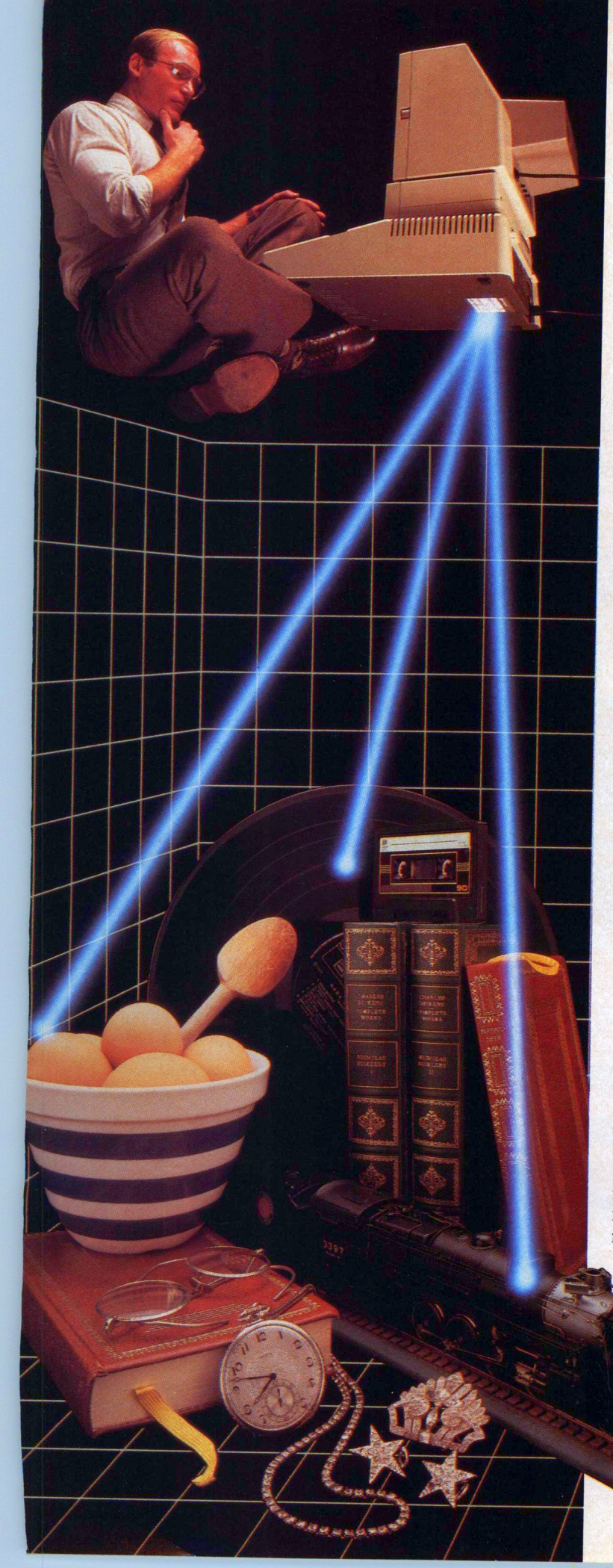

When he went into business in 1980, Kingman looked over the limited number of small-business computers then available and made a decision to "go with the Apple," a decision he says he's never regretted. Unfortunately, none of the database programs available at that time quite suited the needs of Kingman's new business. He wanted to be able to input numbers in some fields and alphabetical characters in others, and have the program go through some complex checking of the data. Since he was going to be handling such enormous amounts of data, the program had to be fast—so he taught himself to program.

"If I were starting over," he says, "the main thing I would do differently would be to attend the Apple Users' Group meetings a lot sooner than I did. The help I got there, once I discovered this gold mine of free information, was simply invaluable." He laughs a bit ruefully.

"There I would be tearing my hair out over some elementary programming problem, a problem it would have been worth almost anything to me to solve. Then I learned to go to one of these meetings and take someone off in a corner, usually some 16-year-old kid, and say, 'Hey, I've got this problem.' And he would know the answer or know someone who did. It was amazing how much information was being developed and shared."

Another lesson Kingman learned early in the life of his business concerned the inefficiency of using support/clerical people to enter data into the one Apple II he had. At first, his analysts produced their input on paper, and then a clerk entered it into the Apple. "It became clear that we could save a lot of money by having our analysts enter the data directly," he explains. "That's when we started adding more Apples. And that, incidentally, is one of the things that appeals to me about Apples. They're relatively inexpensive. The investment you need up front is not very large, and as your business grows, your data processing can grow right along with it. All you have to do is add more Apples."

That's a philosophy that would appeal to Randy Irwin of Arkansas' Bar and Bedroom stores, as well as to Bill Michaels of the Hurst-Euless-Bedford Independent School District. Like Kingman, they manage large amounts of data, and they're proud of the increased productivity their Apples bring to their business lives. ✚



▶ DATABASE MANAGEMENT/BY ELLEN THRO

# MANAGING DATA FOR HOBBIES AND HOME

## Information management is not just for businesses— from recipes to model railroads, your Apple can keep you on track.

Does your insurance company want you to make a ridiculously complete inventory of every possession you own—and the thought of all that work makes you green? Do your books, records, and videotapes lounge on their shelves, longing for a sense of order? Have you possibly fooled yourself into thinking that information-management systems are strictly for businesses?

If you've answered "yes" to any of these questions, an information-management system may be the next application to try on your household Apple. The very program that accurately inventories the paper-clip supply of a corporate giant will work just as arduously for you when the workday ends, sorting through your rare African spider collection, or helping you decide what exactly you should do with those extra egg yolks left over from making a meringue.

Let's look at what an information-management system is. Simply stated, an information-management system is a file containing items with several attributes such as name-rank-serial number or name-address-phone number. If you've used Phone List, one of the sample programs that comes with the Apple II Plus and IIe, you've used an information-management system, often nicknamed *database*. Databases have a terminology of their own, but it's easy to learn because it's taken from the familiar file-card filing systems. Each item and its characteristics comprise a record equivalent to a single file card. Each item of information in a record is called a field or category within the record. A collection of records is a file.

### How Does It Work?

Suppose you're cataloging household possessions in a file. The description of your living-room couch is a record, with these fields:

```
NAME: living-room couch
DESCRIPTION: tan upholstery,
  wooden legs
DATE PURCHASED: 1978
PURCHASE PRICE: $600
VALUE 1-1-84: $200
```

You might have one file for furniture and other files for clothing, jewelry, art objects, and sports equipment. Periodically updated, and perhaps accompanied by photographs, these files provide a complete record for any insurance claims you might make. (Be sure to keep a printed copy in a safe-deposit box or elsewhere away from home.)

Why is a computerized information-management system better than a typed list or card file? One reason is that you can update a database file quickly. Another important feature enables you to sort information by any field and print or display it in several types of reports. For example, if you are club secretary, you can alphabetize the membership list:

```
NAME: Jane Doe
STREET: 16 Ohio St.
CITY: Washington
STATE: DC
ZIP: 20000
PHONE: 555-1234
OCCUPATION: Baker
```

You can sort the list by any of the fields—name, street, city, state, zip, phone, or occupation.

In addition, you can print complete files or selected fields only, such as Name and Phone, either vertically, as in the alphabetical list, or horizontally:

```
NAME       STREET       PHONE
Jane Doe   16 Ohio St.  555-1234
Dick Roe   999 3rd St.  555-4321
```

The amount of data you wish to save helps determine the type of program you use. Some programs—Phone List is an example—limit the size of the databases. Other databases can be as large as necessary, since the program and the data are kept separate.

Some programs can even perform mathematical calculations—a handy tool for files listing items of value.

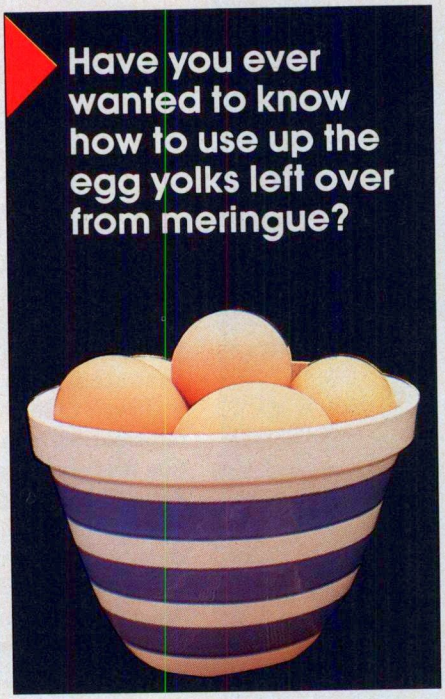
Now that you have an introduction to the world of information management, come meet three people who use their Apples and database software in different leisure-time activities.

### Someone's in the Kitchen with Apple

Stanley Hirsch of the Washington, D.C., suburb of Vienna, Virginia, is an engineer by profession. At home, however, where he is a cooking enthusiast, he has put his Apple to work to solve the problem that plagues all serious cooks—what to do with leftover and seldom-used ingredients. Have you ever wanted to know how to use up the egg yolks left over from meringue, or the anise extract left over from who knows what?

One solution, of course, is to wait until they go bad (if they ever do) and then pitch them out. Hirsch found a better way: he purchased an Apple in 1979 for the specific purpose of solving this problem. Unhappy with commercial software offerings, he decided to write his own. Hirsch broke the problem down into its components:

- location of the recipe
- which unusual ingredients it contains
- the amount of the ingredient called for in the recipe
- how to find the recipe that uses a specific amount of the ingredient




He then developed a package of eight Applesoft programs and three text files to put to delicious use these surplus ingredients and now has a database of over 350 dessert recipes and 110 unusual ingredients. Hirsch has organized his software this way:

- A program he calls Coded Ingredients File creates a series of two-field records, giving for each record a list of ingredients and a three-digit code, such as Orange Flower Water, 999.
- Write Numerical Ingredients writes a file with the ingredients followed by their code numbers. This file is read by the program Read Numerical Ingredients File.
- Another program searches the ingredients file for duplicates that may creep in as its size increases.
- Write Recipes creates a file of four 40-character lines. The first line is what Hirsch calls a title line, giving the recipe's name, a three-digit code for the cookbook or other source, the page number, and the recipe type, also coded. This line is followed by three lines that can contain up to 12 unusual ingredients used in the recipe, coded by ingredient and amount. (Hirsch's analysis of recipes has shown that most recipes have fewer than 12 exotic ingredients.) Each of these 40-character lines is divided into four series of 10 characters each. The first three digits contain the ingredient's three-digit code. The next five show the amount used—in decimal numbers if appropriate—(such as three or 0.500). The final two digits list the code for the measurement, such as cups, whole numbers, or tablespoons.

This file is read by another program called Read Recipes, which allows users to specify those recipes they want to see.

When one of the pesky ingredients appears, the cook uses the Select by Ingredient program—the heart of Hirsch's system—and enters the ingredient's code number. The program then searches the recipe files and prints out all the records that list the ingredient.

Because Hirsch is writing a book on the uses of specific ingredients, he also uses his information-management system to generate an index. For instance,

```
EGG WHITES (BY NUMBER)
 -1-
   Cookies
     Almond crescents, p. 666
 -2-
   Souffle
     Raspberry, p. 333
```

### Coin and Stamp Collecting

Dr. Skip Neiburger of Wildwood, Illinois, is a man of many interests: part-time curator of anthropology (at the Lake County Museum near Chicago), practicing dentist, and longtime Apple owner. He bought an Apple II in 1978, when, as he says, "the only program available was Sink the Ship, in low-res graphics, and Integer BASIC." With the help of two specialized data-management programs and his trusty Ap-

ple, he has found increased pleasure in two favorite hobbies, coin and stamp collecting.

Neiburger began collecting coins when, as a child, he searched for valuables in rolls of pennies. He became interested in stamps when his aunt, who was in the Canadian diplomatic corps, began sending him specimens from the Soviet Union, where she was stationed. Even now, most of his stamps are Russian. Stamps and coins in his collection number in the thousands.

"One of the biggest problems for either a coin collector or a stamp collector," says Neiburger, "is knowing what you've got, knowing what doubles [duplicates] you have, and knowing what you want. And just keeping up a want list is quite difficult."

Before the computer, he says, "I'd forget what I had. The stamps and coins are in big books, and I was a little hard-pressed to check in the books when someone would say, 'do you have any duplicates of one particular coin?' This way I've got everything at my fingertips. When I go to a coin show, I just run off my want list. It takes two minutes, and I know what I'll be looking for. Before I had the computer, I was buying lots and lots of coins that I already had. Which meant that I had lots and lots of doubles. So I also have lists of doubles that I want to trade or sell."

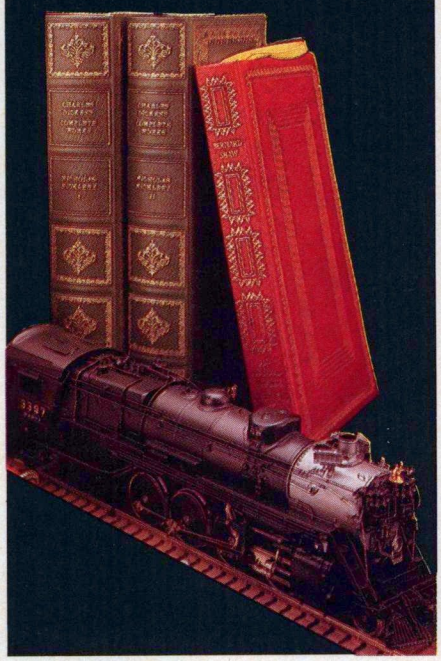
The computer's use in maintaining the collection is also important in a way noncollectors might not realize. "You know," Neiburger says, "collectors are obsessive. They have something nice and neat, and in order, and sorted by year, or by value. But from month to month, everything changes." Periodically the coin and stamp catalogs, whose identification numbers collectors use, go through reorganization and change the numbers. A country changes its name, as when Ceylon became Sri Lanka, or a temporary entity, such as Biafra, will issue its own coins and stamps, as it did when it broke off from Nigeria. When Nigeria reclaimed Biafra, the problem for collectors became: Do we classify Biafran coins and stamps under Biafra or under Nigeria?

Neiburger uses two commercial software packages written especially for coin and stamp collectors. One is Coin Collector Catalog, available from Andent in Waukegan, Illinois, for $49. The program contains several files. One is for foreign coins, another is for domestic coins. Yet another file keeps track of coin shows—where the main activities of buying, selling, and trading take place—and a fourth is a generic file with unnamed fields. Still another file keeps track of sources of information, coins, and supplies. The package also contains a file-transfer program for copying data disks or sending data over a modem. This program is useful, since collectors often compare lists of their holdings.

How does the coin database work? For a fictitious gold coin from the Spanish Main, the fields might read:

```
DENOMINATION: doubloon
COUNTRY: Spain
MINT LOCATION: Mexico City
CONDITION OF THE COIN:
  bright, uncirculated
DESCRIPTION: Blackbeard's
  doubloon
YEAR MINTED: 1680
Value: $50,000
PRESENT VALUE AS OF A CERTAIN
  DATE: (from one of the recog-
    nized coin catalogs) $60,000
SOURCE: (place purchased, or from
    whom traded)
REMARKS: (such as, possible sources
    of sale or further purchases.)
```

**Computer printout sheets contain descriptions and destinations of the day's trains and are a source of reference.**



For a want list the fields are more general, perhaps only denomination, maximum price, and possible sources. A sales list should contain the minimum acceptable price.

Coin Collector Catalog, according to Neiburger, has several features of special value to collectors:

- It is memory-dependent, so increasing the size of the collection won't limit the usefulness of the program. With a program-dependent database, Neiburger says, collectors might end up with three or four files, not knowing which coin is in which file. "It's kind of a damper as far as expanding your collection."
- The program disk is unlocked and copyable. Users can list the program and its internal documentation, allowing modifications such as special printer-control characters.
- Users can define reports, for instance, adjusting the spacing between fields and selecting which fields to include. Preformatted reports are also available.

Andent's Stamp Collector Catalog program, which Neiburger also uses, is similar to the coin program. (Andent also has a program called Museum Catalog, priced at $150, for institutional collectors or private collectors of items other than stamps or coins. One popular home use for Museum Catalog is for cataloging a collection of Depression glassware.)

Neiburger has good reason to be enthusiatic about these programs: he helped design them. The programs were actually written, however, by Dick Stein, one of the authors of the original File Cabinet program—an early database program for the Apple—and are fourth- or fifth-generation refinements of the original.

**Apple's Workin' on the Railroad**

The locale is Bensonville, Illinois, a suburb of Chicago. Freight trains rush along the main tracks, and, on the sidings, the dispatcher commands the movement, loading, and switching of more freight cars. Computer printout sheets contain descriptions and destinations of the day's trains and are a source of reference for the yardmasters and dedicated crew members who do the work.

This isn't a commercial railroad, however. It's a huge model railroad that occupies a warehouse, and the printouts come from files in an information-management program that dispatcher Richard Moser wrote especially for his Apple.

In the business world, Moser is a technician with Chicago television station WBBM-TV, working with the station's computerized control system. As a dedicated rail buff, though, his hobby keeps him active in the local model-railroad club. True to this interest, he even lives near the main line of the Burlington Northern Railroad in another suburb, Naperville.

This is model railroading on a grand scale, featuring 60 scale miles of bidirectional, HO gauge, double track; three major train yards—two endpoint and one midpoint; 31 sidings, ultimately to be expanded to 50 or 60; more than 340 boxcars and passenger cars of various types, plus engines; and mountains and other scenery. Future additions include a branch line and a narrow-gauge rail line through the mountains. The club has 200 members, of whom 15 to 20 are active in regular operating sessions.

In "prototype sessions" (the club's main activity), members try to simulate as closely as possible the operation of a real railroad. Moser uses his Apple II Plus and a data-management program he has written to generate scenarios for these sessions. His program's special features include a random-number generator, the ability to switch data from one field to another, and three files:

1. The car information file contains these fields:
- The car's reporting mark, which is an abbreviation of the company name and a number, such as SP-9999 for Southern Pacific car number 9999
- Car type, in numeric form
- The car's present location, also in numeric form
- Its immediate destination
- Its destination after that

For instance, an order during road operation might be to pick up a car located in Atchison, take it to Topeka to be loaded, and deliver the loaded car to Santa Fe.

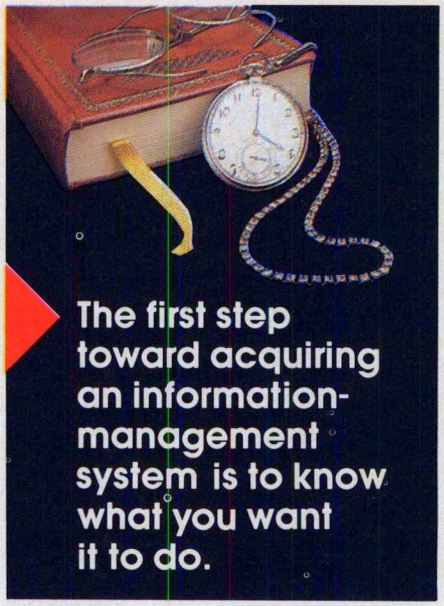
2. Another file contains the characteristics of the various sidings—loading and unloading points—on the railroad system, such as
- the number of cars of various types that each siding can handle and
- the kinds of cars that will fulfill each requirement.

For example, a siding at a factory requires cars of the amount and type necessary to transport the products to be loaded and unloaded there.

3. The third file contains individual operations called "situations," which are made up ahead of time and then selected for a prototype session.

Moser says, "The whole idea behind this program was to be able to set up a system that would say, 'A certain industry on the railroad needs an empty car of a particular kind.' So the system has to say, 'Go and find a car that meets that requirement and route it to that particular destination.' "

He used to do all the planning of the prototype sessions by hand, but with such a large operation it was impossible to keep track of all the possibilities. He then decided to use his Apple to eliminate this time-consuming and tedious work. Several well-known manual systems exist for operating a prototype session, but Moser found that none of them really met the needs of such a large and complex operation. He analyzed all of the existing systems and then wrote his program. Now he can set up a whole session in a few hours, he says, and it's more fun. It takes 10 to 15 minutes to search the database for the cars to be used in one prototype session and another 10 to 15 minutes to print out the data. He prints a departure




list—showing which cars are departing and where they're supposed to go—and an arrival list—showing which cars are supposed to arrive and where they're coming from.

Moser uses the random-number generator in two ways to add variety to the club's operating sessions. First, the search for cars begins at random places in the file so that different cars and routings occur each time a particular situation comes up. He also uses the program to pick the times when nonstop trains, known as "run throughs," will be on the line—for instance, eight "run throughs" in each direction during a simulated 24-hour period. (The clock is speeded up six times during a session, so the operations of a 24-hour day can run in 4 hours.)

At the conclusion of each session, Moser updates the files, entering the cars' new locations. With his program's field-transfer feature, he can easily move information from the immediate destination to present location, for example.

The need for this feature compelled Moser to write his program two years ago, and he has rewritten it several times since.

It uses machine-language subroutines to chain a series of short programs written in Applesoft, thereby enabling Moser to pass variables from one program to another. The data stay in the computer's memory while the programs run, making for faster operation. Moser has designed his system so the data are on a separate disk from the programs—two disk drives are required. The total time put in on the program to date? Moser estimates he has spent approximately 500 hours.

The Apple has also played other roles in the model railroad's operations.

Moser wrote a one-time-use program to schedule the passenger trains, putting into an array the running times from destination to destination, and then calling them out. An example might be the running time for a train going from Springfield to Alton, with one five-minute stop at the midpoint. These passenger schedules don't change.

At one time he considered using the computer to schedule the freight trains, too. Because of the variations in the time required to assemble them, however, the club decided to run freights when they were made up—they are known as "extras" in railroad parlance.

In the future, the club plans to computerize the actual movement of the trains. Right now, the club members control such movement, with detectors showing the position of each one.

As for the program's future, Moser hopes to improve it by speeding up the search time. As he says, a programmer is never satisfied and is always trying to improve the program.

Moser did purchase a commercial database program recently—DB Master, Version 4 from Stoneware Incorporated—which he uses for his wife's address book. Ever the train buff, he also uses it to keep track of the miles he travels by rail each year.

**What Are Your Needs?**

All of these people have found their own unique solutions to managing large amounts of data. As you consider your home information-management needs, keep in mind the following facts:

- The software market has grown rapidly in the past several years, so that many commercial programs exist now that were unavailable even two years ago.
- Some people write their own software for the fun of it or because the commercial programs cost more than they want to pay.
- The first step toward acquiring an information-management system, either by purchasing, designing, or writing it yourself, is to know what you want it to do for you.

Before you go shopping, take the time to jot down what you want from the software. You may not need the most complete and advanced programs. The accompanying Software Checklist (below) can help you make a selection if you compare your list of needs with the software's features. Always try out the software and look at the manual to see if they will be good housemates.

Of course, you will want to balance the cost of the program against your budget limitations. Finally, make sure your Apple system has the required memory size and number of disk drives before you purchase the software! ✚

# SOFTWARE CHECKLIST

- Does the software require a specific amount of memory?
- Is it preformatted for a specific use? Unformatted? Or does it provide both options?
- How many records can you have in a file?
- How many characters can a record contain?
- How many characters can each field entry hold?
- How many files can you store on a disk?
- Does it require a printer? Can you "print" all reports on the screen?
- Is it compatible with your printer? Does it require more than 80-column width?
- Can it perform some mathematical calculations—such as adding field B to field C and entering the total in field D or adding up all the items in one field?
- Can you create your own report formats, varying the space between fields, for instance? Can you line up field entries on either the left (as with names) or the right (for dollar amounts)?

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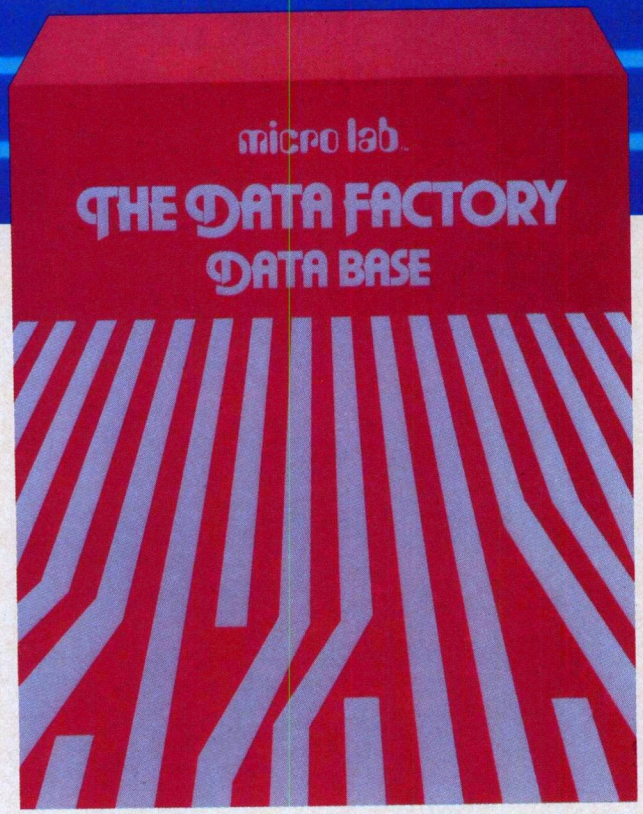


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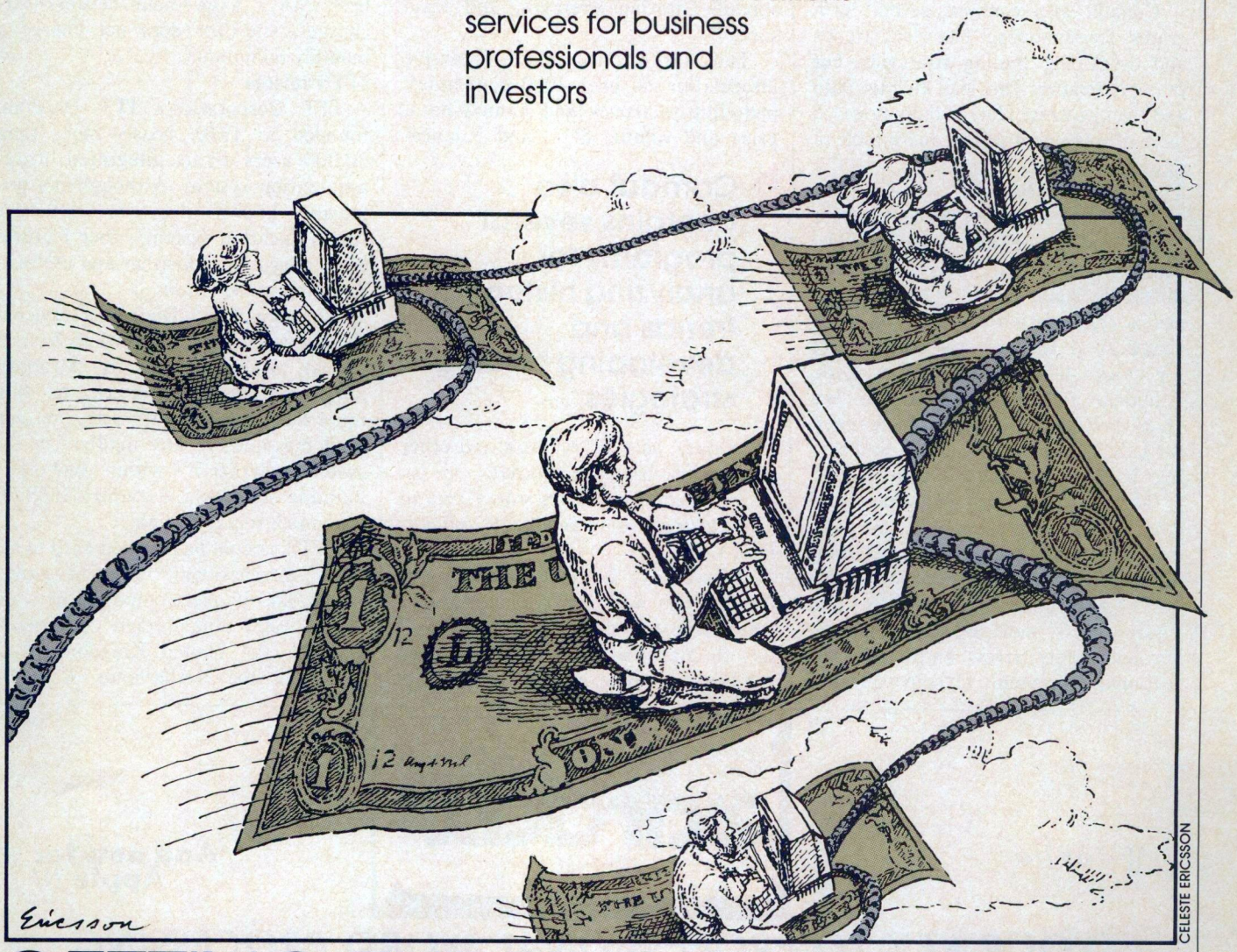


# GETTING THE EDGE IN BUSINESS

A long time ago, some clever businessperson thought up a golden maxim: Time is money. As financial operations become increasingly complex and volatile, the faster you can receive, process, and act on information, the better your chances for profit. The Apple has brought computer power to businesspeople, and now telecommunications services bring them information instantaneously.

Three companies, National Computer Network of Chicago, Inc.; ITT Corporation; and Fidelity Brokerage Services, Inc., offer telecommunications services that can help businesspeople and investors prosper.

**Nite-Line**

National Computer Network of Chicago, which has offered computer services since 1969 and financial databases since 1975, has designed a service called Nite-Line specifically for personal-computer users. It offers a wealth of financial information in an easy-to-use format.

**Traders who use technical analysis will find Comdat a helpful tool for their forecasting.**

Nite-Line consists of four main databases: Comdat contains commodities data; Fiscal provides historical data on stocks, bonds, options, and indices; Optdat offers a library of options and stock-analysis programs; and The Market File holds financial information on more than 4000 companies.

Commodities traders relying on fundamental analysis will find Comdat of limited use, for it does not contain data on production, imports, exports, and consumption. Traders who use technical analysis will find Comdat a helpful tool for their forecasting, however.

Comdat contains end-of-day data covering 62 commodities on 12 major U.S. exchanges and London. High/low price, volume, and open-interest data are updated daily between 5 and 6 P.M. Eastern time. Historical data goes back to 1975.

The major commodities Comdat lists possess a two-letter commodity code, which describes the commodity and the exchange. For example, Chicago Board

of Trade gold (100 ounces) is CH, Comex gold (CEI) is EG, Chicago Mercantile Exchange gold is MG, and London gold is LG. Using this code, traders can pull information from the database.

Comdat also contains several programs for analyzing historical trends and developing trading strategies. For example, traders can load in raw data and then generate plots of daily prices, a table of settlement prices, and a table of moving averages.

**The Thread of History**

Fiscal holds data on stocks, options, bonds, and indices dating back to December 1, 1978, and includes prices, dividends, stock splits, and changes in cusips (registration numbers on stock certificates). Data records are available for stocks listed on the New York, American, Toronto, Montreal, and Over-the-Counter Stock Exchanges; for U.S. Government, agency, and savings bonds; and for mutual funds.

The database also contains fiscal data dating back six months on daily information and two years on last-trading-day information. In addition, Fiscal has 19 programs, including point and figure charts, moving-average plotter, Granville plot/narrow, and Wilder directional movement, to help you analyze fiscal data.

Optdat holds a library of 38 options and stock-analysis programs geared for technical analysis. Programs include point and figure charts, conversion spreads, moving averages, and ratio spreads.

The Market File contains extensive information on over 4000 companies, including quarterly and annual data, price and volume data, and balance-sheet data, as well as ratios and other calculations based on this data.

**Comdat also contains several programs for analyzing historical trends and developing trading strategies.**

Nite-Line also allows subscribers to send electronic mail and create and edit data files.

Nite-Line's Comdat, Fiscal, and Optdat cost $20 per hour for prime time—8 A.M. to 6 P.M. local time, Monday through Friday—and $9 per hour for nonprime-time use for 300-bit-per-second (bps) service. Add $6 per hour for 1200-bps service, and $3 per hour if you access Nite-Line through a network. The Market File carries a flat hourly rate of $45 for 300 bps and $78 for 1200 bps, with a $3-per-hour network surcharge. Nite-Line does not charge a monthly minimum.

**ITT Dialcom**

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The core of ITT Dialcom's service is the Executive Communications System (ECS), which includes its extraordinary electronic-mail service. As with other electronic-mail services, you can send messages to any mailbox in the system, whether it's within your office building or across the country. ECS offers much more, though.

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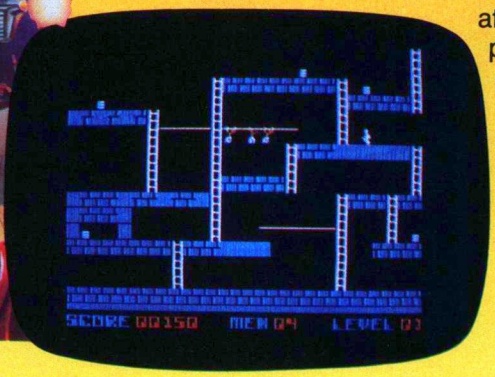

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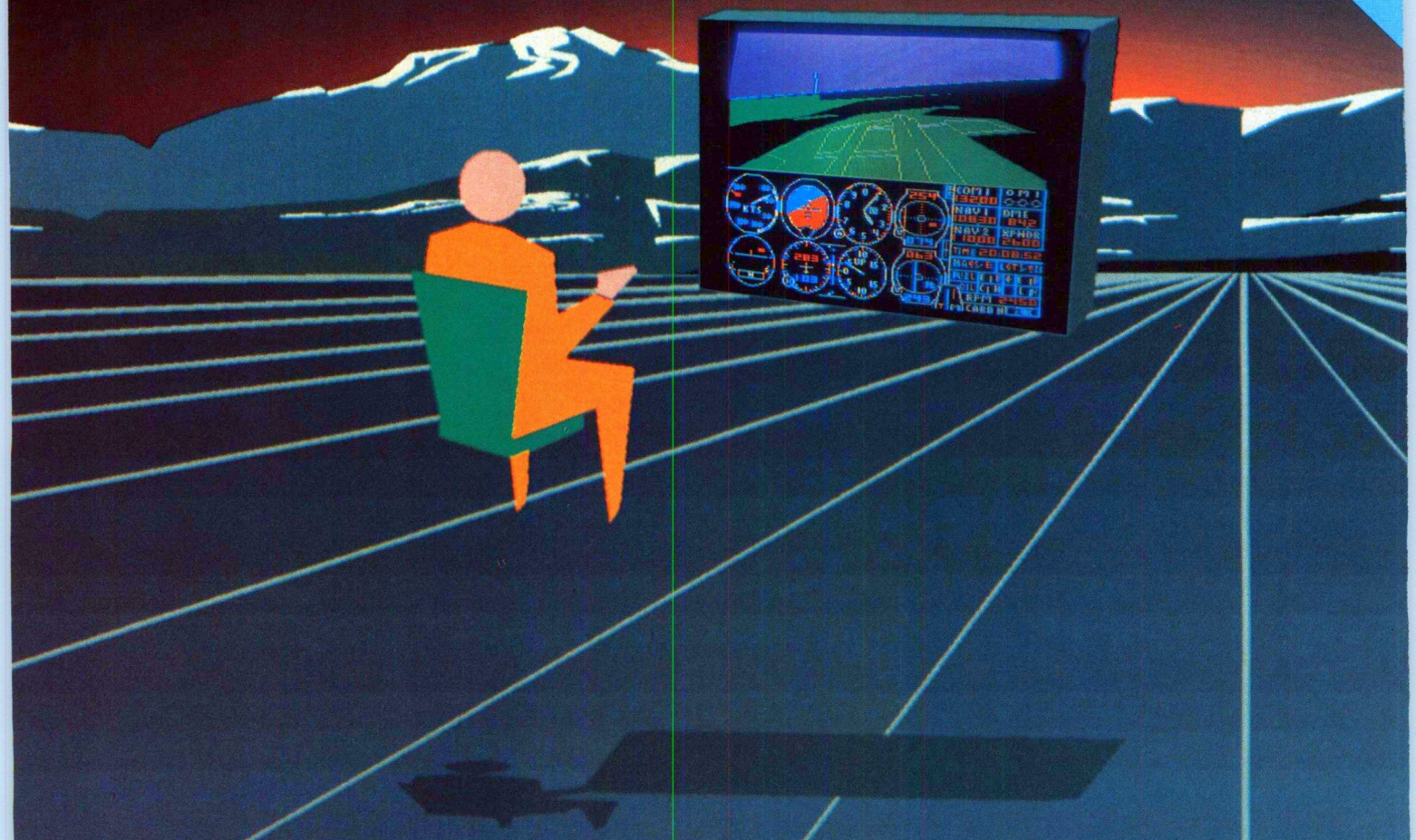

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**ITT Dialcom also offers the Executive Support System, a group of time- and task-management services.**

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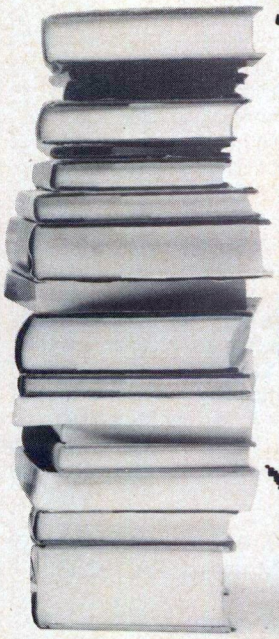

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▶ GRAPHICS/BY ROBERTA SCHWARTZ

Don't have a color printer? The Color Printer software package is an inexpensive alternative.

# YOU CAN PRINT A RAINBOW

I created the graphics that accompany this article with my Apple computer and an Epson printer.

What's that, you say? The Epson is not a color printer. Well, here's good news for anyone who owns an Epson, Gemini, or Apple DMP printer. To get color printouts of your Apple's high-resolution screens, you do not have to invest thousands, or even hundreds, of dollars—all you need is Color Printer, a new program from Enhanced Software Products.

The package includes one diskette and four colored-printer-ribbon cartridges. An eight-page pamphlet guides you, step by step, through the printing process. It includes illustrated instructions for changing ribbons and aligning your printer paper. The program is so simple to use that you should be able to read the manual once and never have to refer to it again.

The diskette is not copy-protected. Duplicate it and use the copy, secure in the knowledge that the original is stored in a safe place.

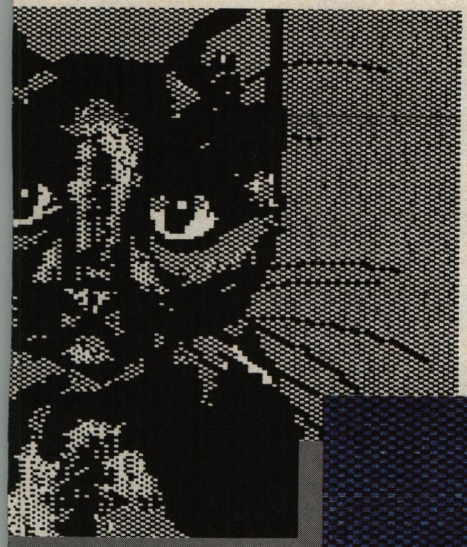
**The Program**

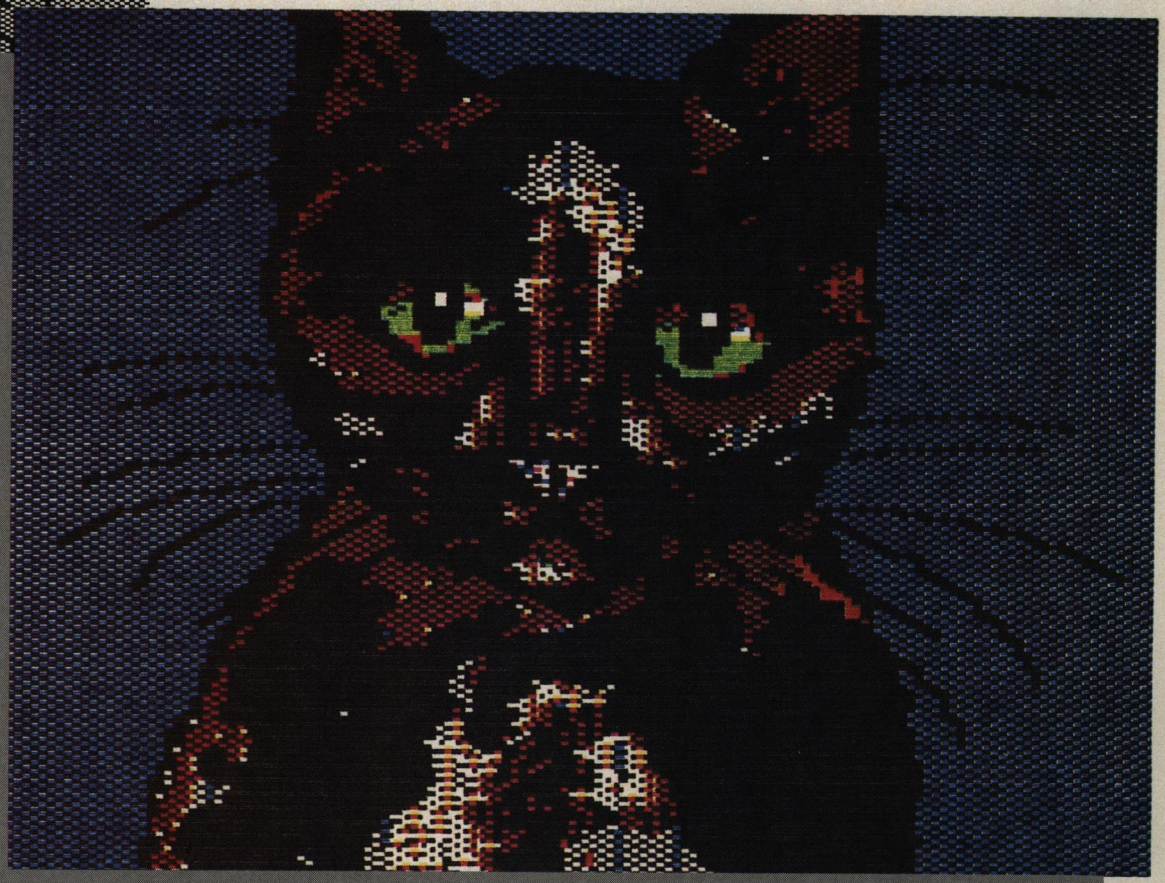
In its Hi-Res mode, your Apple computer gives you four colors: green, violet, blue, and orange, plus black and white. Color Printer uses a color-separation routine with these four colors to give you a whole range of colors. The program breaks down the multicolored image that you create on the hi-res screen into four separate one-color images, in addition to a black image. Each color then prints separately.

To help you grasp the concept of color separation, the art above shows you a picture broken down into two of three colors plus black with each color printed separately. The final figure of the cat (far right) shows the final result of all three colors plus black; this time I rolled the paper back between printings so that each color printed on the same paper. The separated colors combine to create a multicolored image.

You create a color print by inserting your own diskette of hi-res graphics into the disk drive. The program then prompts you to enter the name of the picture you wish to print by using Color Printer's Catalog command. When you have loaded your picture onto hi-res page 1, the screen prompts you for each step of the printing process.

First, you turn off the printer, insert





the yellow ribbon, align your paper, turn the printer power on, and then press P, for *print*. The screen displays the part of the image to be printed, in this case the yellow, and prints it. When the printing stops, your computer beeps three times. The program returns you to the printer screen and prompts you to turn off the printer, install the red ribbon, roll back your paper to the starting point, turn the printer back on, and then press P to begin printing the next color (red). When all the colors have been printed you can choose to run Color Printer again or quit.

**The Colors**

The ribbons that come with Color Printer are green, red, blue, and yellow—you supply your own black ribbon. When the screen color is orange, the program prompts you to install the yellow ribbon. When the screen color is violet, you receive a prompt to install the red ribbon. The blue, green, and black ribbons correspond to the colors on the Apple's screen. The red and yellow ribbons do not match the Apple's violet and orange, however. You might think that getting the primary colors red and yellow would be preferable to making do with violet and orange, but the color substitution actually causes problems for artists who need accurate reproductions of their screen graphics. You can compensate somewhat by mixing colors, but you should keep your eyes open for orange and violet Epson-compatible ribbons.

If you have ever used graphics software to expand your hi-res palette, you may find that Color Printer's "translation" of your hi-res screens is not always predictable. Light colors, such as the orange-and-white mix on the clown's face (page 64), do not reproduce as well as some other color combinations.

I created 54 colors on the Apple with a program called Designer's Toolkit. All of the colors were clear on the screen, but some of them are unidentifiable on the printout.

Color Printer gives you many options. You can print your entire graphic in one color or in full color. When you choose to make a full-color print, the program asks you whether you want the white areas on the screen to print as black (Normal mode) or the black areas on the screen to print as black

(Inverse mode). Your next step is to decide whether you want your full-color graphic to be printed in the Regular mode or the Enhancement mode. The Enhancement option is excellent. The Apple displays colors only on alternate screen dots. When you want blue or violet, every other pixel, in even columns, lights up on the screen. When you want orange or green, every other pixel, in odd columns, lights up. Thus, when you print out what's on the screen, the colors reproduce as patterns of dots. The Enhancement mode of Color Printer fills in the spaces between the dots, which enables you to print solid colors (see figure below).

The program does not restrict you to using the colors it suggests. If it prompts you to install the yellow ribbon, you can choose to install the red ribbon or the blue ribbon. This flexibility lets you create many color variations of any graphic. Pressing the Escape key after you input anything causes the program to back up one step. Using this function, you can print an area in yellow, press the Escape key to back up, and print the same area again in red. The result will be a yellow-red mix, or orange.

*The two bars on left show regular-mode printing. Enhanced-mode printing (right) gives you solid colors.*

You can skip areas of color by pressing V instead of P. V allows you to view the color separation, instead of printing it. E ends the program. When the program asks if you want to run Color Printer again, you can answer yes, indicate that the picture is already on the hi-res screen, and print the same areas again—but this time use the Regular mode instead of the Enhancement mode. You can mix colors and modes to your heart's content. Be aware, though, that you should print from light to dark. If you are going to print an area in yellow and in red, to create an orange, print the yellow first, and then the red, to prevent color contamination of the ribbons.

With Color Printer, you can press the space bar at any time to stop printing temporarily. Pressing the space bar again restarts printing. If, instead of pressing the space bar a second time, you press E, the print cycle will end and the print screen will reappear. The provision that lets you stop the printing process at any time is extremely important. I have, on occasion, used graphics dumps that lacked an option for stopping the printer. When the ribbon twisted or the paper jammed, I had no recourse but to turn off the printer and, thus, sometimes crash the program.

The Color Printer diskette includes a Kaleidoscope program, which generates symmetrical, random drawings. Using the keyboard, you can change the colors the program generates. You can freeze the screen at any time, to save it to disk or print it—in color, of course.

To allow you to experiment with a variety of printers, the manual provides the printer setup information for the Epson in a DATA statement. Understanding how this data affects the Epson can help you make the adjustments that might work with your printer.

You can purchase replacement ribbons directly from Enhanced Software Products, at $10 for any single color or $34 for a set of four colors. I have made 15 full-color prints in the Enhanced mode and 3 prints in the Regular mode, using the set of ribbons that came with Color Printer. The ribbons are still producing vibrant colors.

**Affordable Compromise**

Color Printer is an excellent compromise for those of us who would like color prints of our graphics but do not wish to invest in an expensive color printer. Using the program requires nothing more than the patience necessary for ribbon switching—a simple process with Epson printers, since they use cartridges that snap in and out with minimal effort—and paper alignment. Once you perfect the paper-alignment process, which does take a little practice, the program will reward you with exciting results. Color Printer is a welcome addition to the array of outstanding graphics utilities available for Apple computers. +

## ▶ PRODUCT INFORMATION

**Color Printer**
Bob Aronson, Author
Enhanced Software Products, Inc.
P.O. Box 178
Wantagh, NY 11793
(516) 799-2679
**List Price:** $69.95
**Requires:** Apple II, II Plus, or IIe; 48K RAM; Applesoft; one disk drive, parallel printer interface; Epson MX-80 (with Graftrax), Epson FX-80, Epson RX-80, Star Gemini 10, Star Gemini 10X, or Apple DMP printer

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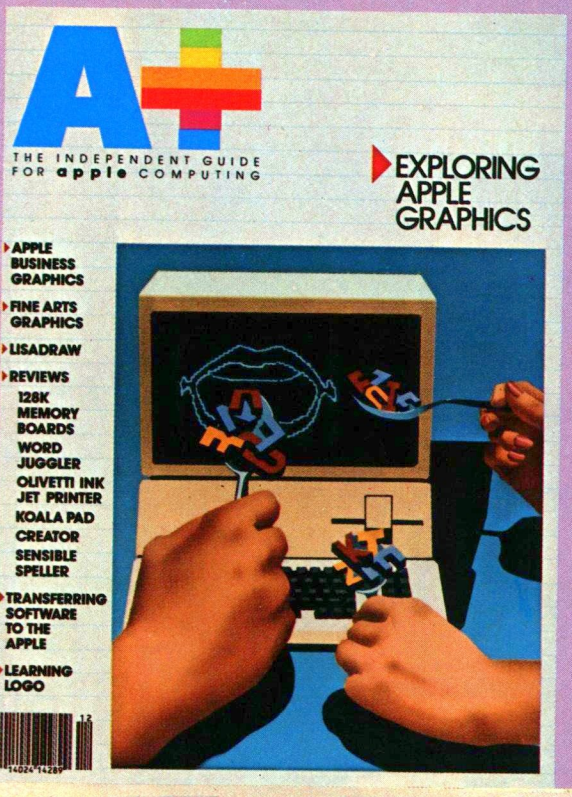

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# MODULA-2

## ON THE APPLE TOO

Pascal users can now learn to program in the Modula-2 language.

Thanks to Volition Systems, the programming language Modula-2 is now available for the Apple II and Apple III and works in conjunction with the Apple Pascal operating system.

The people at Volition assume that many Apple owners know Pascal and own the Apple Pascal System. Thus, they believe that including it with the Modula-2 package would be redundant (and less cost-effective); versions written for other computers include everything you need. Volition concluded that it didn't have to educate users in those aspects of Modula-2 that they already knew from using Pascal. So, if you are just beginning to explore programming and are trying to decide where to begin, this product is not for you yet. First you should learn Pascal.

Modula-2 is a direct descendant of Pascal. It uses most of the basic concepts of its parent, and most programs that run on the Pascal system can also run on the Modula-2 system (a major exception is the Pascal compiler).

You write programs in the same fashion as with Pascal. Your writing is in the form of text (called source code), which you translate later into machine code that the computer can use. All you need to do is run a program called a compiler, which does the translation for you. This distinction between source code and machine code enables you to translate your program to run on many different computers.

If you have been programming for a while in the Pascal language, you should try Modula-2. If you have the same experience with it that I have had, you may even discard your Pascal for Modula-2.

**What You Get**

Volition's Modula-2 comes with a large loose-leaf bound manual and three diskettes. The company has also included the current edition of *Programming in Modula-2* by Niklaus Wirth, the computer genius who wrote both Pascal and Modula-2.

The manual cautions that you will need to refer to the Wirth book and a users' manual for the UCSD Pascal System (not included). Since you run Modula-2 under Apple Pascal, a non-standard Pascal, you'll need a manual for it as well.

The Modula-2 manual has six sections, each with its own index. I suppose this is a useful scheme to allow changes in parts of the manual without completely redoing the whole thing, but it is confusing for readers, who have to consult six separate indexes to find a particular bit of information. Each of the sections is well laid out, however, and refers the reader to other sections to clarify information.

**Most programs that run on the Pascal system can also run on the Modula-2 system.**

The six sections are Modula-2 users' manual (7 pages), introduction to Modula-2 (79 pages), standard library (38 pages), utility library (16 pages), the Modula-2 system (73 pages), and the implementation guide (26 pages).

The three disks are the Modula-2 system, the Modula-2 library, and a sample program disk. Volition has included a utility program to translate Apple Pascal library files into the Modula-2 library. The company's programmers have already translated the graphics parts, so you don't need to do that yourself.

Volition intends to provide both manual and program updates, which will cost you some more money (naturally), but it's nice to see a software house spell out its replacement and update policy. Volition will be adding new functions to its library, too. This version of Modula-2 is based on Pascal 1.1, and the company will be issuing a new version when Pascal 1.2 comes out (later this year). When I had to call Volition to get the answer to some questions, the support personnel were friendly and helpful.

I had a chance to talk with Volition's vice-president, Winsor Brown. He mentioned that a new version (3.N) exists that permits the Modula system to run Pascal programs that use long integers. He reminded me that although Modula-2 is single-precision, meaning that it uses only integers in arithmetic operations, a library module is available that handles decimals. This module is particularly useful for business programs that use dollars and cents. It permits you to manipulate amounts up to 19 digits long.

Another interesting development is a version of Modula-2 for the Macintosh. It will run under P-code and be integrated with the Macintosh's display. You will be able to call up the Modula-2 compiler with an icon. The whole system, in addition to your program, will fit in the 128K Macintosh. With this system, programmers will be able

to develop applications for the Macintosh without the need for a Lisa or a hard-disk drive.

**The Modula-2 Language**

Modula-2 is a structured programming language. *Structured programming* is the term programmers use to describe certain qualities that simplify reading and writing programs. These qualities, which are a matter of programming style, are not engraved in stone. Support for them is growing among programmers, though.

Some programmers believe that a program's structure should reflect its tasks, in the order that they are performed, and that tasks that are to be done together should be grouped together in the program, for the sake of readability. Furthermore, the program's logic should be embodied in the program's structure. If any areas are still unclear, then programmers should use comments (lines that describe to readers what is happening in the program). In other words, good structure clarifies meaning.

A clearly written program is a must if you need to adjust it to changing conditions. If you have ever tried to figure out how a program worked, just by reading it, and you became frustrated because you couldn't follow what was going on, then you have experienced a poorly structured program. You can write readable programs in any language, but you may find that the syntax of Modula-2 aids readability.

Modula-2's syntax provides ways to separate sections of program code from the rest of the program. You can specify

**A clearly written program is a must if you need to adjust it to changing conditions.**

exactly what goes into these sections and what comes out of them. These sections are called modules, and an understanding of them is central to the understanding of this language.

To understand modules, you need to know something about what programmers call the "scope of variables." When you "declare" the variables in a program, those variables can then be visible to other routines besides the ones for which you created them. This versatility becomes an important consideration when you write two routines that use the same variable for different purposes. If you can't keep track of the values stored in variables (because you have too many routines using them), then your program may end up using the wrong values. The scope of a variable defines which other parts of the program can use the variable.

Modula-2 offers programmers much more control of scope than do languages such as Applesoft. In Applesoft, you cannot limit the scope of variables. All variables are visible to all parts of the program. Consequently, all Applesoft variables have global scope. You can get hopelessly lost trying to figure out why an Applesoft program doesn't work when you inadvertently redefine variables. Applesoft lacks the ability to define a variable's visibility, but Modula-2 has this important ability.

**Invisible Modules**

Modula-2 programs are collections of procedures called modules. These modules have their own names within the main program. When you create a module (by naming it MODULE SomeName), you make the operation of the module invisible to the rest of the program. You provide connections from the module to the rest of the program through "Import" and "Export" commands.

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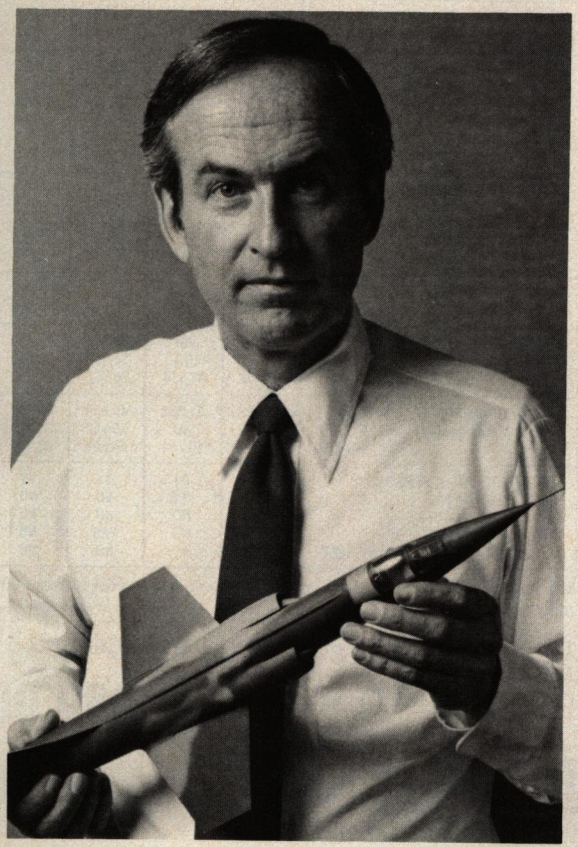

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The Import command permits you to designate the variables and procedures that the module "sees," and the Export command lets you determine what the module sends out to the rest of the program. Variables that you define in the main program are not available to the procedures in the modules unless you use the Import command. Procedures that the programmer defines inside a module are invisible to the rest of the program, except when you use the Export command. The other variables inside the module are significant only to that module. These variables exist only

## ▶ THE ASE SCORES HIGH

The ASE (pronounced ace) is the Advanced System Editor from Volition Systems. The company sells the ASE as an option with its Modula-2 package. You don't have to buy it along with Modula-2, but you can get a package price that is cheaper than what you would pay if you bought the ASE and Modula-2 separately. Since you need to run the Volition Systems Modula-2 with your Apple Pascal operating system, you have an editor already.

The Apple Pascal operating system includes its own editor, which you can use to compose Modula-2 programs, so you can get along without the ASE and save $100. If the extra cost doesn't bother you, get the ASE, too. It's a powerful editor, and it has some abilities that you will find useful.

It features a file-menu selector that displays the first line of each text file; multifile editing that lets you move sections of one file to another and "nest" one file inside another; a terrific Xchange command, whose typing direction can be up, down, left, or right (permitting you to draw a vertical line); and function keys that can remember a series of keystrokes that you define yourself (several keys have been set for the Apple II Plus or IIe already). You can edit long files too, as large as a whole diskette.

This package is impressive. The one thing I object to is the way you return to the editor after the compiler detects an error. The ASE makes you retype the name of the file to get back into the editor. The Pascal editor, in contrast, permits you to type an E, which automatically returns you to the editor with your program in memory.

Anyone who is familiar with Pascal will have no trouble adjusting to ASE. You can use it without knowing about its added commands, because ASE uses the same style of one-letter commands and provides the same menu line at the top of the screen. The manual provides clear explanations for all of these commands.

The ASE manual has a good tutorial and is well written. The installation procedures are easy to follow, and Volition has preconfigured its diskette to make it easy to get it going on your Apple Pascal/Modula-2 system. The ASE disk is not copy-protected, and the manual advises that you make at least two backup copies for safekeeping.

The manual's author is enthusiastic about the potential of this product. He boasts that you can use ASE as a text editor—in fact, he wrote the whole manual on the ASE. He had to use a text-formatter program as well as ASE to do it, so don't throw away your word processor. Another claim is that you won't want to go back to the old editor after you have tried ASE. This claim, I believe, is correct.


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1. **TLOAD speed loads all Text Files, random or sequential, to ram.**
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3. **TLIST Lists all Text Files, random or sequential to screen/printer.**
4. **DUMP Memory to screen/printer in Hex with Ascii on right side.**
5. **DISA disassembles Binary to screen or printer.**
6. **AL prints last loaded program Address & Length in decimal & hex.**
7. **HIDOS moves DOS to Language Card & continues operation of program.**
8. **/ is a one keystroke Catalog in addition to the original command.**
9. **DATE prints with any clock. Also File Dating with clock or manual.**
10. **FIND prints address's of hex found in 64k memory. Hidos cmd only.**

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All DOS entry addresses have been preserved. DOS is original length and compatible with most software. David-Dos II is copyable and creates fully copyable updated disks. DAVID-DOS II is licensed by programmers for inclusion in the software they sell. Init areas were used for David-Dos II. Works with all Apple IIs including IIe 80 Col, Franklin & Hard Disks, such as Corvus & Xebec. Requires 48K. Complete documentation for screen or printing and many utilities are on the disk.

| All times in seconds. (Time Test programs available) | | DAVID DOS-II | ProDOS | DIVERSI DOS | DOS 3.3 |
|---|---|---|---|---|---|
| TEXTFILES (100 Sectors) | TSAVE | 8.0 | NO | NO | NO |
| | TLOAD | 6.2 | NO | NO | NO |
| (791 Strings, 32 chars ea) | WRITE | 29.3 | 28.0 | 29.4 | 88.4 |
| | READ | 24.3 | 16.3 | 24.3 | 83.8 |
| | PRINT/READ | 44.2 | 45.9 | 45.1 | 117.1 |
| (442 Sectors, 7 x 500) | APPEND | 142.3 | 142.9 | 151.1 | 1231.2 |
| APPLESOFT (100 Sectors) | *SAVE | 7.1 | 16.4 | 6.4 | 33.1 |
| | LOAD | 5.0 | 4.0 | 5.0 | 23.5 |
| INTEGER (100 Sectors) | *SAVE | 7.3 | NO | 6.6 | 33.4 |
| | LOAD | 4.9 | NO | 4.9 | 23.4 |
| BINARY (100 Sectors) | *BSAVE | 7.8 | 18.4 | 7.3 | 28.7 |
| | BLOAD | 5.8 | 4.8 | 5.8 | 24.5 |
| 48K PROGRAM SPACE (With 3 Bufs avail) | APPLESOFT | 36,352 | NO | 36,352 | 36,352 |
| | INTEGER | 36,352 | NO | 36,352 | 36,352 |
| | BINARY | 36,352 | 34,816 | 36,352 | 36,352 |
| 64K PROGRAM SPACE (With 5 Bufs avail) | APPLESOFT | 46,592 | 31,232 | 45,658 | 35,162 |
| | INTEGER | 46,592 | NO | 35,162 | 35,162 |
| | BINARY | 46,592 | 40,704 | 45,658 | 35,162 |
| NUMBER OF DOS COMMANDS | | 37 | 29 | 31 | 28 |
| CLOCK FILE DATING | | YES | YES | NO | NO |
| MANUAL FILE DATING | | YES | NO | NO | NO |
| ONE KEYSTROKE CATALOG | | YES | NO | YES | NO |
| AUTO USE INTEGER CARD ANY SLOT | | YES | NO | NO | NO |

Each Program was tested twice W/Apple Clock Card on a newly formatted disk containing DOS.
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| Word & List Commands | Yes | Yes |
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when the program calls the module and cease to exist when the module finishes operation.

Modules can make a complicated program a lot easier to write. You can organize your program in a general way to obtain the results you want before dealing with the specifics of how the program arrives at the results. At first, you treat the modules as though they were black boxes that produced the results you want. You decide exactly what the black box needs to take in to arrive at the desired result that it will send out. Later, you can write the procedures that actually produce the results within the module.

Modules simplify creating libraries of routines that you can use within your programs. These routines are modules with specific imports and exports. Using modules allows you to design your own commands as well.

The general set of Modula-2 commands is actually quite small when you compare their number to the command set of some other languages. In fact, commands that you may think of as part of a programming language (such as print statements) are library modules in Modula-2.

These library modules deal with specific operations. Instead of one print statement that handles all output to the screen or printer, Modula-2 has many different kinds. One example is the library module InOut.

InOut contains several different modules. Each of them is a procedure for the input or output of data from your program. You add these procedures to your program by using a statement such as FROM InOut IMPORT WriteString. WriteString is one of the procedures in the standard library module called InOut. Others are Read, ReadString, ReadInt, ReadCard, Write, WriteIn, WriteInt, WriteCard, WriteOct, WriteHex, OpenInput, OpenOutput, CloseInput, and CloseOutput.

Modula-2 is even sensitive to the use of uppercase and lowercase letters (Volition Systems version includes a command that causes the program to appear as all uppercase for systems that can't handle lowercase).

Some programmers see such specificity as a drawback, because they have to put extra thought into exactly what kind of variables they use. The other side of the coin, however, is that fewer problems crop up if you can limit your code to specific conditions.

Modula-2 programs contain only those procedures that are necessary to their function. There is no reason (in

## ▸ LEARNING MORE

If you want to learn more about Modula-2, here are a few sources for more information. Volition Systems offers its manual (by Richard Gleaves) for $45. It comes with a coupon that you can use toward the purchase of the Modula-2 language. You will find a description of the language (written by Gleaves and Joel McCormack) in the April 1983 issue of *Byte* magazine. Sometime before the end of the year, you will be able to read Gleaves again, because he has written a book called *Modula-2 for Pascal Programmers* (Springer-Verlag). Niklaus Wirth's own *Programming in Modula-2*, Second Edition (Springer-Verlag), has all the charm of a concrete slab, but it covers the subject. Finally, you can take a look at a new book from John Wiley & Sons entitled *Software Engineering With Modula-2 and Ada* by Weiner and Sincovec.


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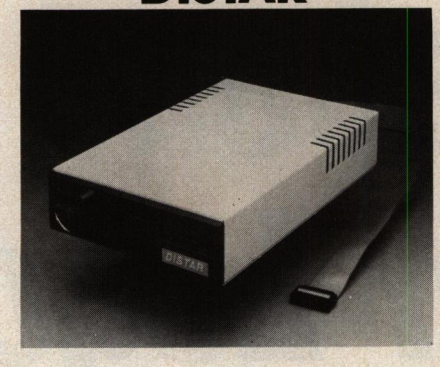

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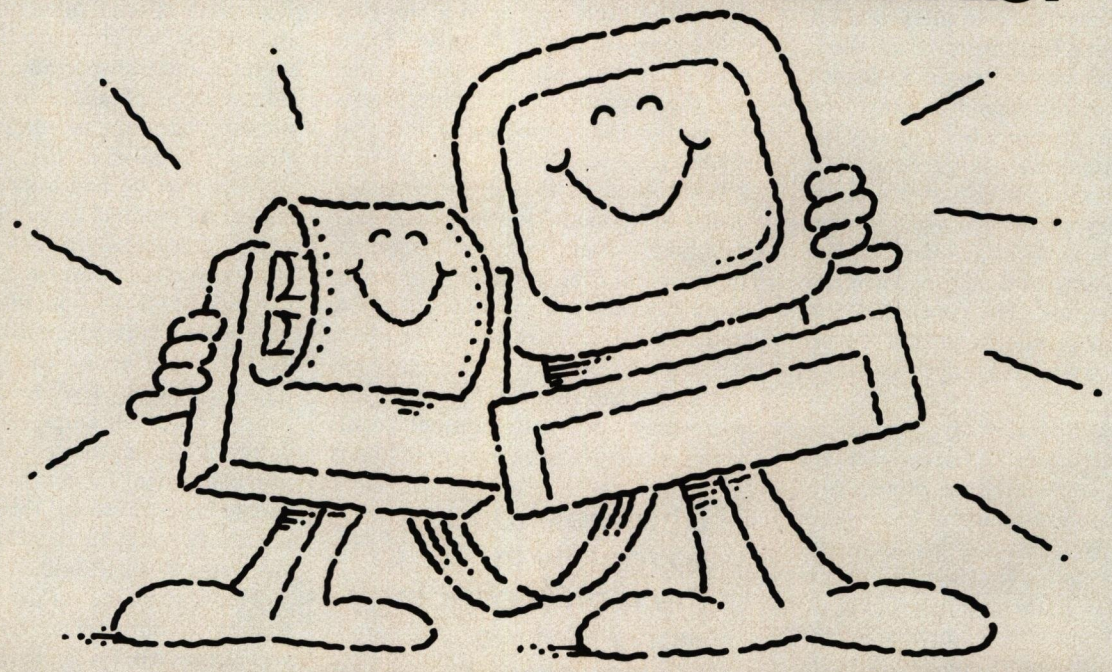

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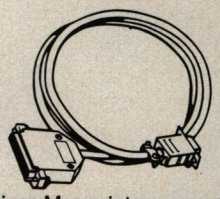

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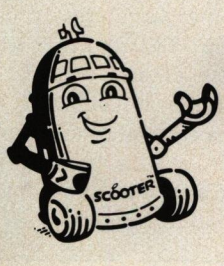


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## NIKLAUS WIRTH AND MODULA-2

Changes happen so rapidly in the high-technology world that we tend to forget that individual geniuses are responsible for most advances. One of these individuals is the Swiss-born Niklaus Wirth, who, as a graduate student at the University of California at Berkeley, decided to spend more time finding out how people used computers and less time designing the hardware for them.

He was on his way to a Ph.D. in electrical engineering when he turned from computer architecture to computer languages. Systems were large, he said, because they were ill designed and not because they performed well. A computer language is a tool for thinking about problems, and better tools make better programs. He concluded that good design standards should be applied to computer languages as well as hardware.

With the intention of applying this precept, he began to investigate the problem of embedding the principles of structured programming in a computer language. While still a graduate student, he wrote his first structured language, Euler. Later, as a member of the Stanford University computer-science faculty, he created PL360 and, with the assistance of Tony Hoare, developed Algol W.

He returned to Switzerland in 1967 and, one year later, became a member of the faculty at the Eidgenössische Technische Hochschule (ETH) in Zürich. Wirth said that he wanted a decent structured language for doing what he was interested in—mainly compiler and system programs. Furthermore, he wanted a clean language with clean concepts, for teaching purposes.

Wirth thought that if you exposed students to bad habits (e.g., teaching nonstructured languages such as BASIC), getting rid of these habits later on would be difficult. Many educators must have agreed with him because, since he created and introduced his new language—Pascal—in 1970, its popularity has grown explosively.

Programmers soon started using Pascal and adding their own extensions to the language. The language for teaching programming had become a major language for program writing. Programmers added their favorite routines and specialized functions. Machine-specific procedures proliferated in programs, creating roadblocks to transferring programs from one system to another.

Many people have tried to come up with a version that everyone could agree with. The versions so far include the ISO (International Standards Organization) Pascal, January 1978; another by commercial programmers in July of the same year; and a third by ANSI (the American National Standards Institute), which is still trying. Even the Department of Defense has its own ideas of what the language should be (Ada).

Wirth thought that if the language needed to be modified, then there was something wrong with the language. He believed that a language writer should have the courage to write a new language, rather than trying to patch an old one.

If Wirth had stepped into the Pascal controversy, one programmer complained, he might have been able to settle it. Wirth was getting interested in something else, though. A new idea—multiprogramming—had caught his attention. He focused on the interesting problem of how to get more than one program to run on a computer at the same time. While this challenge was occupying him, he took a sabbatical year at the Xerox Palo Alto Research Center (Xerox PARC) in California. Researchers there were working on the idea that an operating environment should consist of self-contained parts that could call on each other.

**Changes happen so rapidly in the high-technology world that we tend to forget that individual geniuses are responsible for most advances.**

Before his sabbatical he had worked out a bare-bones language that embodied these abilities. "The effort to crystallize some sensible programming rules boiled down to designing certain structures into the language," he explained. His effort resulted in the first version of Modula, which combined Pascal concepts with the idea of independent modules.

Wirth subsequently drew on his experience with Pascal, Mesa (the Xerox PARC language), and Modula to write Modula-2, a fusion of the virtues he found in each parent. In order to make Modula-2 as efficient as possible, he gave the language a minimum number of commands. A library of routines dealt with special functions for input and output, which made the language compact and transportable to other machines (a goal of Pascal, too). Wirth answered programmers' complaints about Pascal with Modula-2.

Now that he had a structured language, he wanted to build a machine designed especially to run it. This approach was the reverse of the usual method: Build the computer hardware; then write a language that can program it. "Everyone knows that advances in VLSI technology have resulted in inexpensive processor chips, while software design is the expensive, difficult-to-design component for computers. But few people have translated this into designing hardware to fit software instead of vice versa," Wirth said.

He was looking into the idea of designing a computer at ETH when he was contacted by Richard Ohran, an assistant professor at Brigham Young University in Provo, Utah. Ohran wanted to work with Wirth on a Ph.D. project. "We agreed," recalled Wirth, "that he would learn about software, and he would teach us about hardware. When we started, we didn't have a soldering iron or a chip."

The computer that resulted, called Lilith, is a one-language machine. (Its original name was MAX, which stood for Mormons and Xerox). It executes Modula-2 without an intermediate assembler—Lilith compiles Modula-2 code at the rate of 10,000 lines per minute. It has what one report described as spectacular graphic capabilities. The screen is bit-mapped and, depending on software control, can address each of $808 \times 606$ pixels. Like the Xerox star, it can divide the screen into windows, and it has a three-button mouse cursor controller. Wirth and Ohran were providing the computer to interested parties for $15,000 in 1982, and they were getting quite a few takers.

These days, Wirth is back at ETH as the head of the computer-science division, and Ohran is back at Brigham Young, where he and Wirth coordinate the Modula Research Center.

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Modula-2) to use memory to hold procedures that you don't need. If you need to print only integer numbers (numbers without a decimal place), then you don't need to clutter your memory with a procedure that handles decimals.

**Extra Features**

Modula-2 has other features that give you, the programmer, powerful tools. You can directly manipulate memory pointers (the addresses of the items you store in memory). You can even make dynamic arrays that change size. These arrays can contain pointers, procedures, or other arrays. Some commands perform functions on sets of data. All these commands permit you to write compact, low-level instructions, as well as high-level ones. The manual claims, in fact, that these features have similarities to those of C, a language that you find running on large computer systems in conjunction with the UNIX operating system.

Many of the fancy graphics the top graphics companies are producing are writen in C. Take a look at the opening 15 seconds of "Nova" on public television. David Geshwind of NYIT created it, using C.

This language has many more abilities than one short review can cover. I haven't mentioned coroutines. You can write a scheduler for your programs that spells out which routines have priority over others. You can transfer control from one to another and interrupt one to run another one. You create interrupts entirely in software and don't have to depend on the computer hardware for them.

**With Modula-2 you can write programs that are independent of the system that runs them.**

With Modula-2 you can write programs that are independent of the system that runs them. Write an application on an Apple and run it on a Sage. If your program does not require hardware specific to a particular machine (e.g., Apple graphics), then you can take your source code and compile it for the IBM Personal Computer or whatever system you want it to run on. Software producers have promised this ability for Pascal, but it didn't work very well in practice, because of the many nonstandard "standard" Pascals available. The Modula-2 from Volition, says Winsor Brown, has striven for source-level compatibility. You can compile for UCSD Pascal with the CP/M operating system, write part of your program on a Sage, create another part on an IBM PC or PC XT, and run it on any of the systems. If you have an Apple III, the filing-system modules automatically distinguish between SOS and Pascal formats. If you don't like your operating system, you can write your own entirely in Modula-2.

In my opinion, you will be hearing a lot more about this language in the coming months. Its features reflect much of the current thinking about computer languages, and other companies besides Volition are working on versions of Modula-2. Keep your eyes peeled, because competition may bring down the price. If you don't want to wait for promised products, here it is in a good package.If you can afford it, go get it. +

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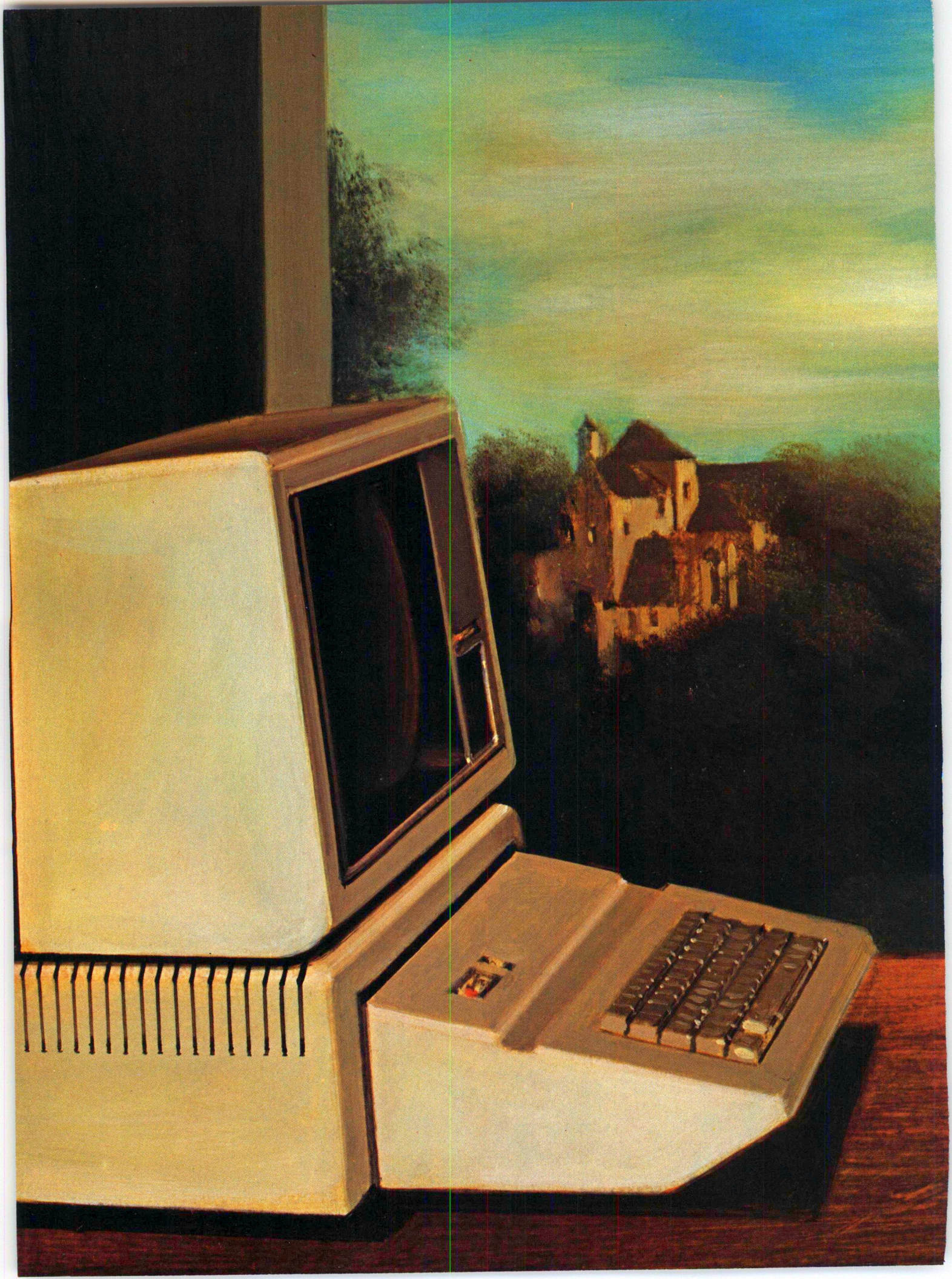

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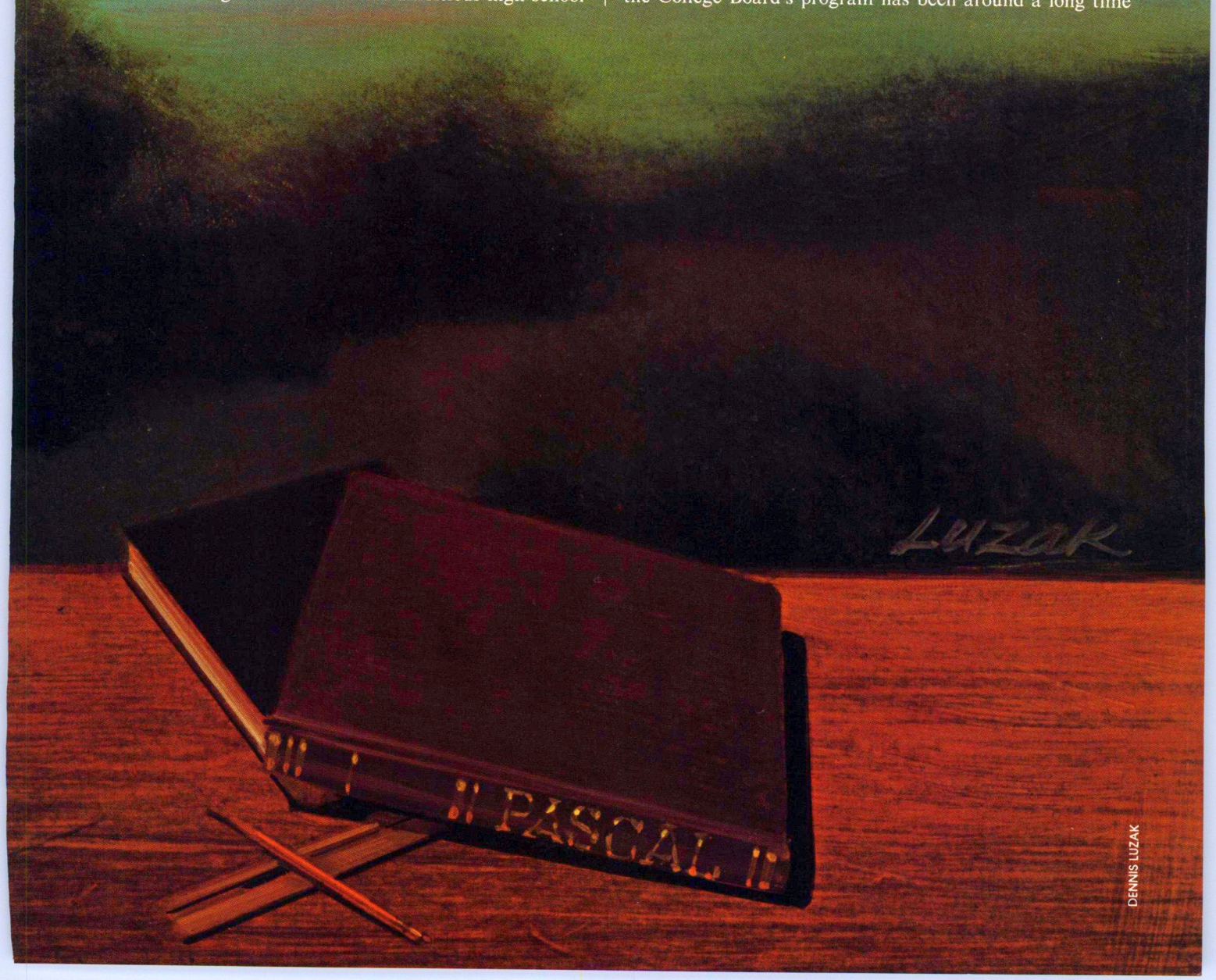
# HIGHER EDUCATION AND HIGH-LEVEL LANGUAGES

## New Advanced Placement high-school courses are stirring up a controversy over BASIC vs. Pascal.

In May 1984, for the first time, some of the best high-school computer science students in the country will sit for the new College Board Advanced Placement (AP) test in computer science. The test and the one-year high-school course that leads to it are a milestone. The College Board organization and the educators that sit on its committees now recognize computer science as an established academic discipline along with more traditional subjects such as calculus and English literature.

The course is good news for those ambitious high-school students who have a gift for computing skills and whose high schools offer the course. They will be able to go much further into the esoteric realms of algorithms and data structure than ever before. And they will have an assist into college—a high score on the AP test will give students an edge in getting accepted into highly competitive departments and could make it possible to bypass or test out of first-year courses in computer science.

Although this Advanced Placement course is brand new, the College Board's program has been around a long time

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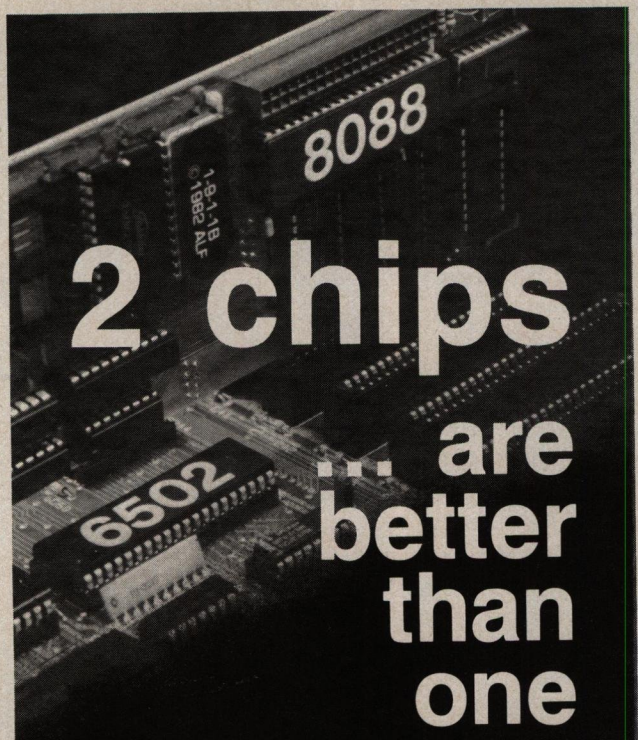


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and covers a total of 24 introductory college courses in 13 fields. About 25% of U.S. high schools offer some AP courses. Students can even take enough AP courses in high school to go directly into college as sophomores—about 20,000 students a year do it.

Advanced Placement courses are always a fine thing for parents. Students who can skip a college course, or even their entire freshman year, on a campus such as Harvard or Stanford save money for their parents, who then see their tuition investment improve because their sons and daughters can go further in four years than they otherwise would have. Parents of AP computer-science students have to adjust to their children disappearing at strange hours, though, to work on available computer terminals at school.

**The Language Controversy**

The choice of Pascal as the language for the Advanced Placement course caused a small furor among high-school computer-science teachers when the course outline was introduced last year. Most high schools teach BASIC for several reasons. BASIC was designed for teaching computing—you can write simple programs almost as soon as you start learning the language. More to the point, there are several million microcomputers in schools, homes, and offices, and their native language is BASIC.

BASIC does have a problem, though. You might say that

**The choice of Pascal as the language for the Advanced Placement course caused a small furor among high-school computer-science teachers.**

it's too easy. You can write a program that works without doing any preliminary planning. Arthur Luehrmann, who, with coauthor Herb Peckham, has written many teaching books for both languages, says that many BASIC programmers hack away at a program until it works—using a brute-force method. "Pascal programs tend to start with the principles of design; you're thinking about the organization at the start." (For Luehrmann's comparison of BASIC and Pascal, see "Why Learn Pascal," page 86.)

College computer-science programs emphasize structured programming, i.e, carefully organized programs that break down into modules that are easily accessible for debugging or modification. Pascal dictates the need for structure. BASIC is also suitable as a structured language, and high-school teachers often teach it that way.

At Washington High School in Milwaukee, Wisconsin, teacher Joe Kmoch says, "The first semester of the Advanced Placement course was pretty much top-down design techniques, which we teach around here anyway. The kids have had two to three years of top-down stuff . . . we write BASIC that way, we write COBOL that way." *Top-down*, you have probably gathered, is another way of describing structured design techniques.

High-school computer-science teachers, many of whom got their degrees in math and still teach math courses, could be reacting to an attitude of snobbery at the college level. "His superior up there at the university says, 'Well, that's just BASIC. *Real* programmers don't program in BASIC—they use advanced languages like Pascal,' " says Luehrmann.

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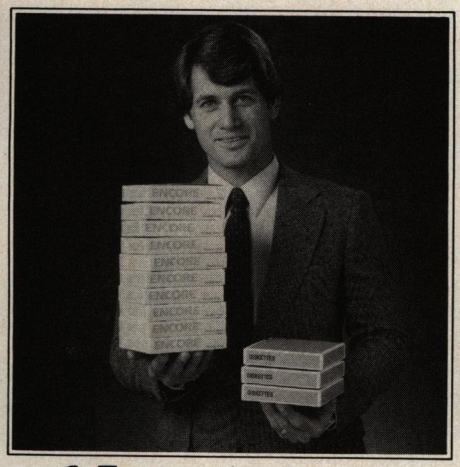

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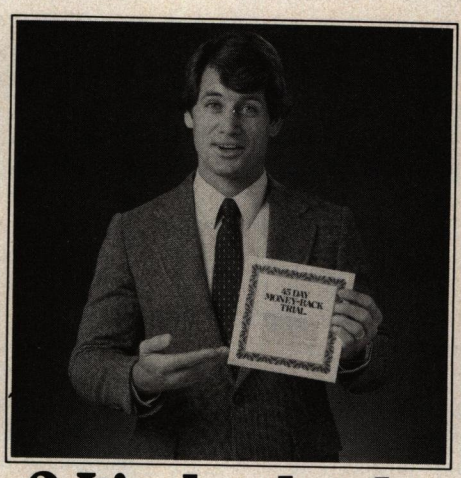

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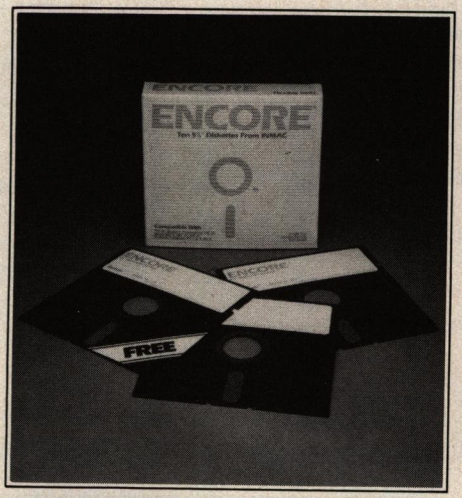


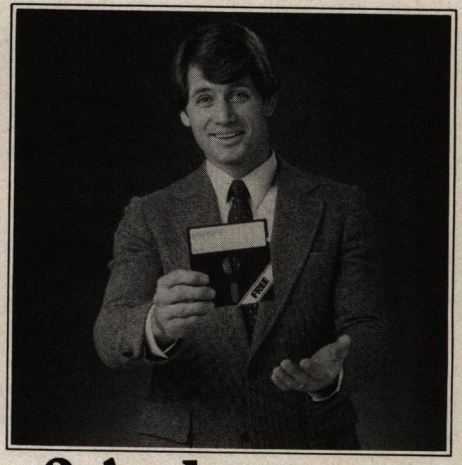

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A recent article in *Classroom Computer Learning* suggested that the College Board course will result in the replacement of BASIC by Pascal as the primary language of computer teachers. Leroy Finkel, computer outreach coordinator for the San Mateo County, California, Department of Education, is uncomfortable with that proposition.

"I can't argue with the rationale of the Advanced Placement course. The purpose of the AP exam is to give high-school students college credit for a college-level course, and the first course in computer science in college is not in BASIC, it's in Pascal! My feeling is that in addition to current computer course offerings Pascal will soon have to be available in those schools where there are a sufficient number of college-bound students who are interested in a computer-science major and in taking the AP exam. We're not going to stop teaching BASIC, but we will offer Pascal when it is appropriate."

Criticizing BASIC because of its potential for "spaghetti coding" could be an obsolete bias within a few years if the American National Standards Institute (ANSI) succeeds in getting software and hardware developers to adopt its newly developed ANSI BASIC.

Luehrmann is on the ANSI committee for BASIC. "Both Pascal and BASIC are in flux, so you should recognize that you're talking about a moving target. The first ANSI standard, called Minimal BASIC, has been out about four years. Minimal BASIC is kind of a toy language—you can't do much with it. It was an attempt to nail down some of the common features. Apple BASIC is more or less compatible with Minimal BASIC, although it has a few things wrong with it.

"Many of the things people don't like about BASIC have been corrected in ANSI BASIC. It's a much more sophisticated language and it includes many features that are in Pascal. A lot of the complaints about what's wrong with BASIC will disappear when ANSI BASIC becomes a reality. But these features are not in Applesoft; they're not in TRS-80 BASIC; they're not in IBM PC BASIC."

Even though some high-school teachers have already been teaching Pascal, they haven't been teaching it at the level outlined for the AP course. "I recognized when I first got the outline that this was going to take a serious amount of studying," says Joe Kmoch, who is midway through his first year of teaching the AP class. Kmoch went to a four-week course at Carnegie-Mellon University in Pittsburgh, Pennsylvania, last summer. "It needed four weeks; it needed concentrated study. I was living and breathing Pascal. I really don't see how anyone can offer a course without either having taken courses in some of these topics or having gone to one of these summer sessions."

Owen Astrachan, who teaches math and computer science at Durham Academy in Durham, North Carolina, also went to a four-week workshop. "I had a pretty good background before I went to the workshop. If I had just dabbled in BASIC on a microcomputer and then was immersed in that workshop, I would not be comfortable teaching what they ask me to teach. I've talked to a lot of teachers who aren't comfortable with it after, say, a five-day workshop."

Astrachan recommends taking a college-level course in computer science, although not necessarily in a language. "Language, I think, turns out not to be as big a factor as people make it out to be. Learning Pascal is not the problem; it's learning the computer-science aspects—analyzing algorithms, doing binary trees.


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CIRCLE 353 ON READER SERVICE CARD

"I think you just have to be willing to go in and not really understand everything you're doing and just hope that you'll learn in the process of doing it."

Joe Kmoch tells the same story: "There are some people around here who think that because I seem to be able to solve a lot of problems, I know everything; and when a really difficult situation comes up, the kids think I'm playing games when I'm really stumped. In this AP class of eight, there are three or four brilliant kids who are much brighter than I am. About the only thing I can do is keep ahead of them a little bit based on some of the stuff I learned this summer.

"I've got to do further preparation for tomorrow! I'm into a unit on sorting techniques, and I'm stumbling all over myself. The kids say, 'That's not a bubble sort; it's a whatsis-sort.' One of the kids has an after-school programming job at J.C. Penney, and as he left class today, he said, 'That's really interesting because one of my tasks right now is to look for better sorting algorithms for use in some of the programming.' So he's going to take some of the things we had on the board today and put them on their IBM PCs over there and test them out—do some timing."

Leigh Dhanens, a senior at Milwaukee's Washington High, is the only female among eight students in the Advanced Placement class. To place this number in perspective, you must know that out of 1500 students at Washington, about 400 take computer courses each year. They are joined by 100 part-timers from nearby schools, who come to take advantage of Washington's unusually fine facilities.

"In a way it's a real honor," Leigh says. "There are only a handful of kids who are able to do it. I had taken most of the other courses, and it was a choice of taking either this course or Advanced BASIC. The AP course seemed more functional. It tends more to be programming techniques instead of programming in any one language. If you have the technique down, you can apply it to any language."

Consider Leigh's daily schedule. The AP class time is spent in lecture; so to get time on a terminal, she gets to school by 7:00 A.M. and works in the computer lab until classes start at 7:55. Sometimes she spends her study halls in the lab as well. After school each day she works from 4:00 to 8:00 P.M. as a programmer in the engineering department of a local company, where she does programming projects and updates BASIC programs.

**'Pascal will soon have to be available in those schools where there are a sufficient number of college-bound students who are interested in a computer-science major.'**

What do her parents think? "They think it's great, and they think it's a good thing to know. They like all the experience I'm getting. They worry a little about the amount of time I spend, you know—'Are you getting enough sleep?' It'll all be over this fall when I start college. I know everyone says college is harder than high school, but I'm not so sure . . . "

Her teacher, Joe Kmoch, plans to recruit for next year's AP class. "Kids are starting to shy away because they're finding out there's a lot of work involved. Some of the programs that kids are writing after one semester have as much code in each


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## WHY LEARN PASCAL?

Both BASIC and Pascal were designed originally for teaching computing. They are both good choices for beginners, though in different ways. BASIC is much easier to get started with, partly due to language design and partly due to the very interactive way it is usually implemented. If you "boot up" your Apple II with the BASICS disk, you can type the following one-line program,

```
PRINT 238 +429
```

press the Return key, and immediately see the program run, with the result 667 printed on your screen.

Pascal, on the other hand, is a bit slower to get into and requires more knowledge of both the language and the computer's facilities for entering, editing, and running programs. The Pascal program to add 238 + 429 and print the answer is four lines long:

```
PROGRAM ADDITION;
BEGIN
  WRITELN (238 +429)
END.
```

To type it, you have to "enter the editor." Then you have to "quit the editor." Then you have to "run the program." If you make a typing error when typing a statement in a BASIC program, you are told so and may simply retype the line. In Pascal you don't discover the error until you run the program. To fix it, you must return to the editor, make the change, quit the editor, and run the program again.

So BASIC wins, hands down, on ease of getting started and of quick trial-and-error programming. Trouble comes, however, when BASIC programs get long and require modifications, perhaps by someone other than the original author. Here lies one of Pascal's greatest strengths: legibility by human readers. Reproduced below are BASIC and Pascal versions of a program that simulates the roll of dice in a craps game. Without worrying too much about the details, decide for yourself which version looks more as if it might actually represent a craps game.

Unless you're already a BASIC expert, you probably will have a hard time seeing any plan or design in what looks like line after line of similar text in the first version. By contrast,

### Applesoft BASIC Program

```
100 DEF FRN (X) = INT ( 1 +6 * RND (X)) +INT ( 1 +
  6 * RND (X))
110 LET R1 = FNR ( 1)
120 PRINT "YOU ROLLED A "; R1
130 IF R1 = 7 THEN 150
140 IF R1 <> 11 THEN 170
150 PRINT "YOU WIN "
160 GOTO 110
170 IF R1 = 2 THEN 200
180 IF R1 = 3 THEN 200
190 IF R1 <> 12 THEN 220
200 PRINT "YOU LOSE "
210 GOTO 110
220 LET R2 = FNR ( 1)
230 PRINT "NEXT ROLL IS "; R2
240 IF R2 = R1 THEN 150
250 IF R2 = 7 THEN 200
260 GOTO 220
270 END
```

### Apple Pascal Program

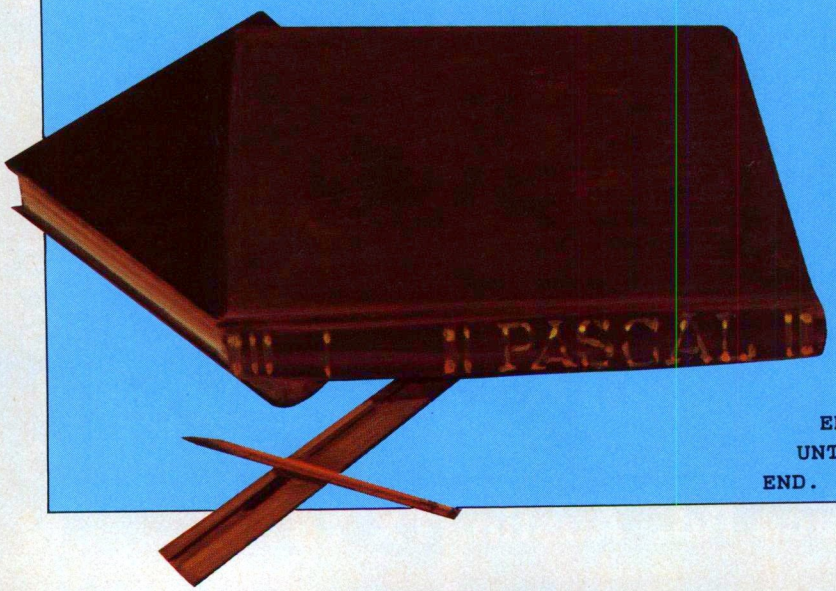
```
PROGRAM DICEGAME;
USES
  APPLESTUFF;

CONST
  HELLFREEZESOVER = FALSE;

VAR
  DICE, POINT : INTEGER;

PROCEDURE ROLLEM (VAR TOSS : INTEGER);

  BEGIN
    TOSS := RANDOM MOD 6 + 1;
    TOSS := TOSS + RANDOM MOD 6 + 1;
    WRITELN ('YOU ROLLED A', TOSS)
  END;
BEGIN
  REPEAT
    ROLLEM (DICE);
    CASE DICE OF
      7, 11:
        WRITELN ('YOU WIN');
      2, 3, 12:
        WRITELN ('YOU LOSE');
      4, 5, 6, 8, 9, 10:
        BEGIN
          POINT := DICE;
          REPEAT
            ROLLEM (DICE)
          UNTIL (DICE = POINT) OR (DICE = 7);
          IF DICE = POINT THEN
            WRITELN ('YOU WIN')
          ELSE
            WRITELN ('YOU LOSE')
        END
    END
  UNTIL HELLFREEZESOVER
END.
```



the text of the Pascal version divides into horizontal blocks of various kinds, with names such as CONST, VAR, and PROCEDURE. Furthermore, Pascal allows the author to use indentation to clarify further the plan of the program. Most versions of BASIC today treat indentation as a mistake and proceed to remove it from the program.

BASIC's problem of illegibility and incomprehensibility increases drastically as a program grows in size and complexity, and Pascal's edge widens quickly. Experiments have shown that Pascal programmers are several times faster at making changes and corrections to larger programs than are people using unstructured languages such as BASIC and FORTRAN.

There is another reason why Pascal is a good first language to learn. As a relative newcomer to the family of computer languages, it benefits from a lot of deep thinking that went on among computer scientists as to why programs written in the languages available in the early 1960s were so hard to prove to be correct. The result of their studies was a set of language requirements that make it possible merely by a careful reading of a program, block by block, to know if it will work. This design makes Pascal a structured language.

In a very real sense, Pascal is a working model of modern thinking about certain goals of computer languages. Like all good models, it is being widely imitated. The new American National Standards Institute (ANSI) FORTRAN standard includes some of the same organizational structures found in Pascal. Work is nearing completion on ANSI BASIC, which also includes all these structures, as well as long variable names and named procedures. Among languages emerging today, it is fairly accurate to describe Ada, the language soon to be required of all contractors who want to do business with the U.S. Department of Defense, as an enhancement of Pascal.

**It always pays to use the right tool for the job, and for many jobs BASIC on a computer such as the Apple II is the right tool.**

Learning to program in Pascal, therefore, is a good way to become familiar with language ideas that appear not just in Pascal but in some older and most new and newly revised languages. Your next language will be easier if you already know Pascal.

Even so, it always pays to use the right tool for the job, and for many jobs BASIC on a computer such as the Apple II is the right tool. It is easy to get into, gives you quick error diagnoses, and is a cinch to edit and try again—just the things Pascal is weakest at. Simple problems usually yield to a quick-and-dirty, trial-and-error approach and don't justify much planning. The trick, of course, is to know when that approach is likely to fail, so as to avoid it. Our rule of thumb is simple: *If your program is small enough to fit on your TV screen, stick with BASIC. If it's bigger or if it's probably going to grow bigger, switch to Pascal.*

Adapted wtih permission from the authors and McGraw-Hill Book Company from the introduction to *Apple Pascal: A Hands-On Approach*, by Arthur Luehrmann and Herbert Peckham (New York, 1981)

one as other kids write in a whole year's course." He'll look for his candidates among students in advanced math and college algebra who have also had one programming course.

**What College Professors Think**

When Educational Testing Service (ETS), the subcontractor that developed the AP test and the course outline for the College Board, put the course outline out for review among college educators, the response was mostly favorable. "There were some specific questions, but the response to the language being Pascal was really positive," says Jefferson Wadkins, who with colleague Jim Braswell oversaw the development of the test and course outline at ETS. "They said things like, 'We didn't think ETS would have the wisdom to do anything like this,' or 'We didn't think you could convince people to do this—congratulations!' "

**'Programming to me is problem solving. Most students can catch on to the rules of doing a programming language. What you need to do is give them big problems and emphasize the planning aspect, the organizational parts of it.'**

Phil Miller of Carnegie-Mellon is the current chairperson of the College Board committee that worked with ETS to develop the AP course outline and test. Although the program is now off the ground, he is considering what to do about a concern articulated by Mike Clancy, who coordinates the lower-division computer-science courses at the University of California at Berkeley.

"My main reservation on the course," says Clancy, "is that there is too little emphasis on writing big programs. Programming to me is problem solving. Most students can catch on to the rules of doing a programming language. What you need to do is give them big problems and emphasize the planning aspect, the organizational parts of it, complexity management, that sort of thing.

"If somebody came to me with a 3, which is a passing score, I wouldn't know whether they'd done any big programming or just a lot of little programs and then memorized a lot of little things." The Berkeley first-year course generally overlaps with the AP course, though.

Was the College Board surprised by the rash of journal articles and letters protesting the language decision?

Harlan Hanson, director of the AP program at the College Board, says that he and his colleagues are flattered by the amount of interest. "We have mounted new AP programs in the past—art history or music theory—but they didn't attract as much lightning as computer science. But if there is a useful role for the board to play, we are prepared to deal with the tempests."

The committee the College Board appointed to work with ETS in developing the course outline is ongoing, according to Hanson. "It's a working committee of school and college teachers, and they meet several times a year. They will go on with maybe a change now and then."

The AP Computer Science course, like the two languages that caused the controversy, appears to be a moving target. +

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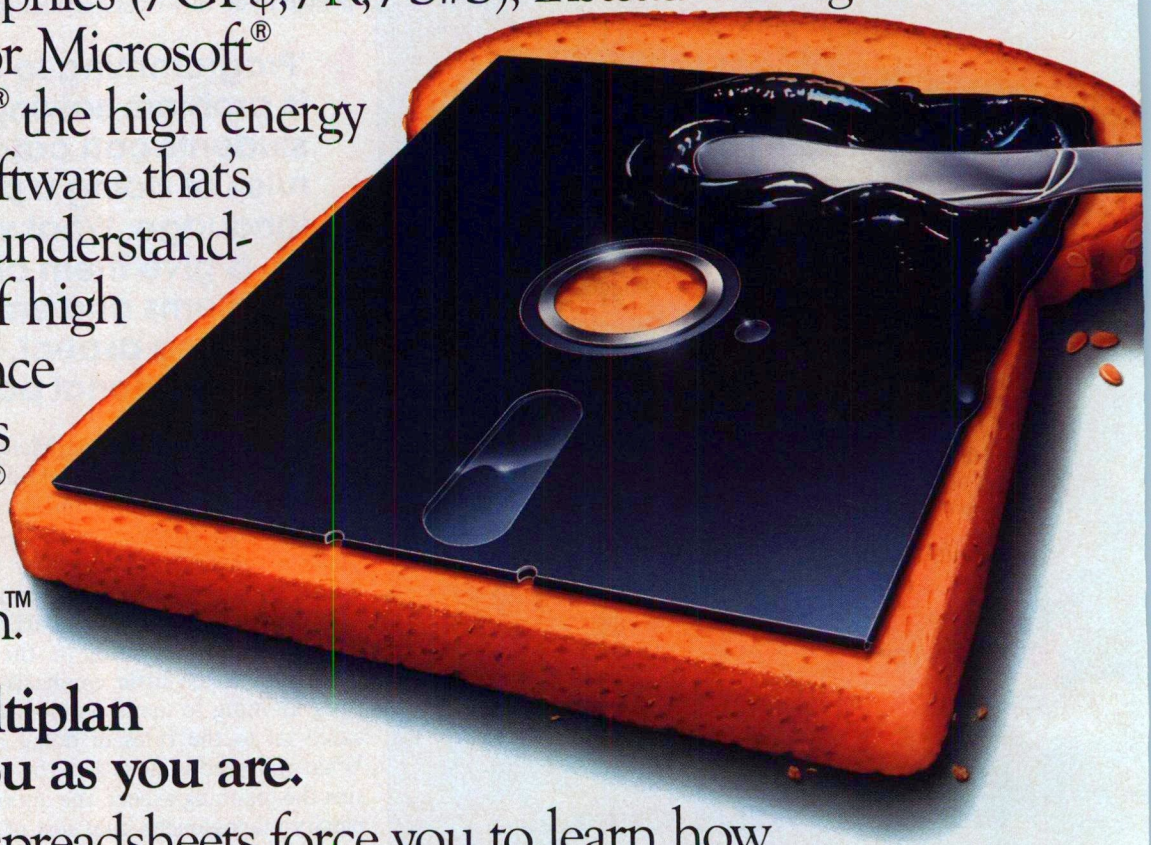

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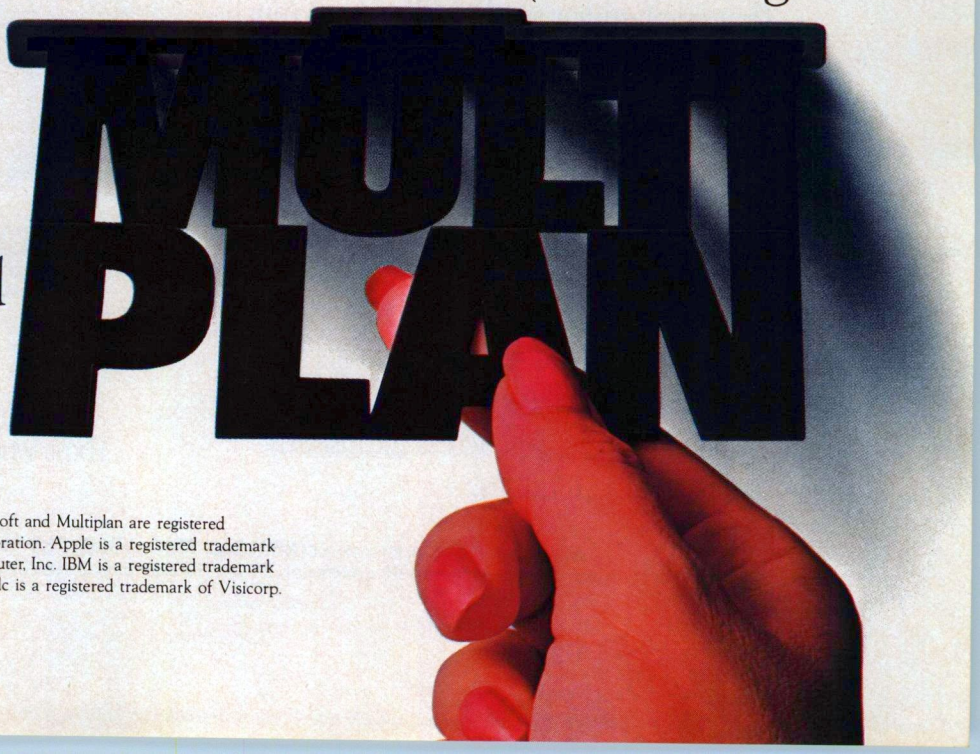


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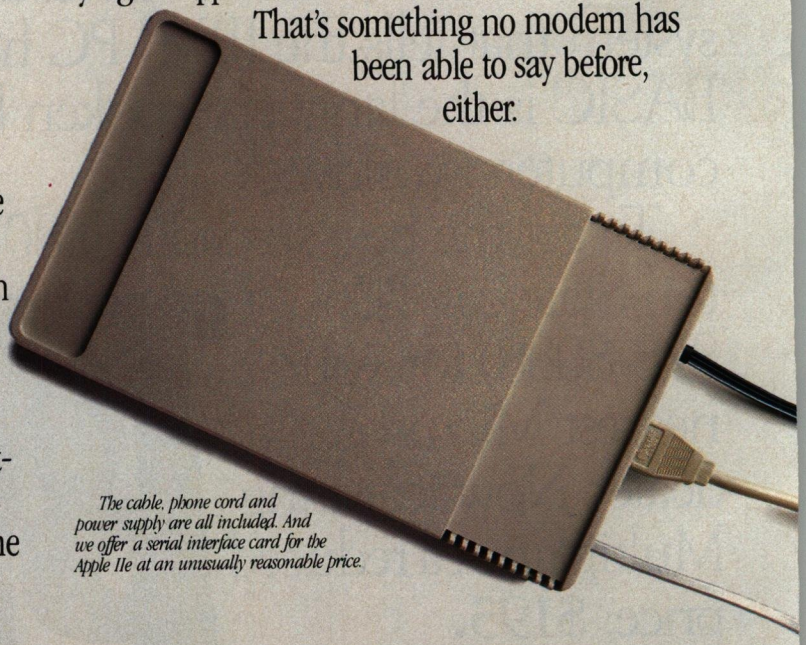

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# ENTERTAINMENT

## GAME REVIEWS

### DINO EGGS

MicroLab, Inc.
2699 Skokie Valley Road
Highland Park, IL 60035
(312) 433-7550
**List Price:** $40
**Requires:** Apple II, II Plus, or IIe; 48K RAM; two-button joystick

CIRCLE 990 ON READER SERVICE CARD

In the year 2047, an intrepid time traveler, Time Master Tim, rides a time warp millions of years into earth's prehistoric past to study the dinosaurs. In the process, he unwittingly carries a virulent strain of 21st-century measles into the Mesozoic era and unleashes a deadly epidemic among the thunder lizards. Tim realizes the contamination cannot be reversed. Yet he can still save the species from extinction by digging up the "dino's" eggs and transporting them into the future.

Dino Eggs, a colorful and captivating arcade game, whisks you back to prehistoric times in a crusade to save the dinosaur. As Time Master Tim, you scour a cliff face for eggs, dig them up, and deliver them to a time portal. Sometimes the eggs hatch, and Tim must run after the baby dinos. Meanwhile, all sorts of primordial nasties threaten to devolutionize you into an arachnid, and Dino Mom wants to stomp you into the stone.

Each game of Dino Eggs consists of ten sequential cliffs, or levels, with each cliff more hazardous than the last. Each cliff, randomly generated, consists of four ledges, which contain crevices to jump over, handholds to climb, and boulders to send rolling downward. The eggs are either sitting on the ledge or under the boulders. The all-important wood, which is used to light fires and keep Dino Mom away, also lies on the ledges or underneath the boulders.

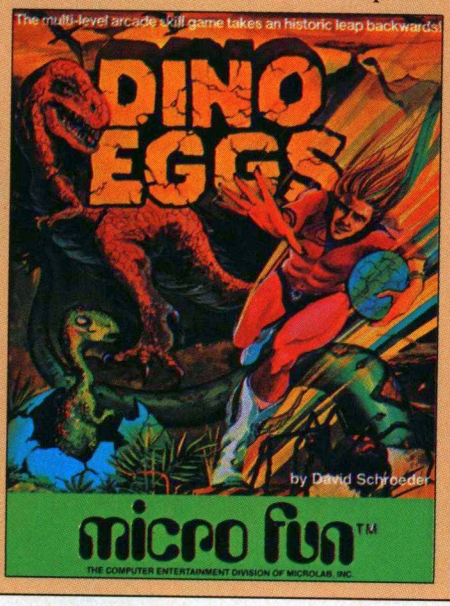
**Cretaceous Crawlers**

Time Master Tim faces hordes of poisonous snakes, spiders, and centipedes as he runs around the ledges. As you advance to more difficult levels, these creatures become more deadly and appear in ever-increasing numbers.

The snakes slither along the ledges, forcing you to hop over them, while the spiders drop from above on web strands. The centipedes travel faster than the snakes and scurry either along the ledge or on the walls just above your head.

Only the snakes and spiders appear in the first three levels. These horizontal and vertical hazards pose little threat to you, however, as you easily outmaneuver them.

On the fourth through sixth levels, fast-moving centipedes appear. If you try to leap over a snake, the centipede bites you in midhop. If you duck the centipede, the snake bites you. Spiders continue to drop from above, and they also try to kidnap the baby dinos.




The speedy centipedes appear on the ledges in the seventh through ninth levels and Time Master Tim is hard-pressed to maneuver around the cliff. The tenth level contains nonstop, frenetic action with an army of creatures and an aggressive Dino Mom.

**All sorts of primordial nasties threaten to devolutionize you.**

Designer David Schroeder programmed the game with an innovative twist. In most games, the hero suffers instant death when touched by one of the animated antagonists. In Dino Eggs, on the other hand, whenever Tim is bitten, he becomes temporarily paralyzed, and a biological time bomb starts ticking. If he returns to the safety of the time warp before his biological clock runs out, the time bomb is defused and he may continue collecting eggs. If Tim cannot reach the warp in time, he suffers a devolutionary spasm and metamorphoses into a spider.

**Jurassic Jump**

The joystick controls are fast and responsive. You jump over snakes and centipedes, hop over baby dinos, and leap over crevices.

As the spiders descend, you can cut their web strands. You roll boulders off ledges to squash snakes and centipedes, and if one boulder strikes others, you can create some pretty impressive avalanches.

Unfortunately, boulders aren't very discriminating. They will crush a baby

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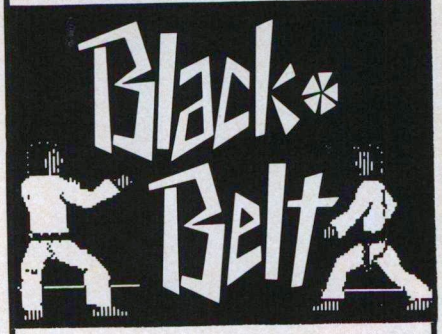


**Programming by Kevin Ryan**

**Black Belt** is a challenging arcade game of the martial art, taekwondo. The Mockingboard sound and speech synthesizer, joystick and keyboard combine for both fun and learning. Championship sparring rules and the disk's practice section teach you the forms. Designed with input from professionals, **Black Belt** is a skill game in which brutality and rule infractions affect score.

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dino as well as a centipede and snuff out a fire as quickly as a snake's life.

Frequently, you must roll the boulders to uncover hidden eggs. You can carry only three eggs at a time, unless you eat a "power flower," which allows you to carry an infinite amount of eggs. You lose this extra carrying power, not to mention dropping all the eggs you're carrying, if a creature bites you.

If an egg hatches, you must cage the baby dino by jumping over it and simultaneously pressing a joystick button. You need not carry the baby dino into the time warp to receive points.

**Triassic Tango**

Naturally, Dino Mom becomes pretty unhappy that some little carnivore is stealing her eggs and caging her babies. Every so often she steps in to try to stop your paleontological pilfering by dancing on your head. She leads with a green scaly foot, measuring about a quarter of the screen wide, and you don't dare follow. When she decides to put her foot down, you've got to be faster than Fred Astaire to sidestep her one-step.

The only way to send Dino Mom tap-dancing through the treetops instead of over the cliff is to light a wood fire. Dino Mom's terrible toes will never appear if you place one piece of wood on top of another, which is akin to rubbing two sticks together.

The fire not only scares Dino Mom away, but it also burns any creatures that blunder into it. Lighting a fire works well for snakes and spiders. On the other hand, the baby dinos are too dumb to know what fire does and occasionally end up as a primeval Kentucky-fried stegosaurus.

**Mesozoic Masterpiece**

Dino Eggs' graphics are spectacular. The multicolored boulders of blue, orange, green, and purple contain cracks and rough edges, just as real rocks do. The white eggs, which are more oval than egg-shaped, hang underneath orange ledges. The fire flicks out blue, orange, and green sparks.

Time Master Tim wears the latest 21st-century fashions. He sports a blue jumpsuit with white helmet, boots, gloves, and belt. The snake is simply a squiggly white line, but the purple-and-green spider looks sinister as it skitters across the top of the screen and descends on a green web strand.

The best special effect in the game occurs whenever Tim starts devolutionizing. All action freezes for a split second. Spider legs emerge from the top of Tim's head. As the spider legs grow,

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| Self Test at Power Up | ✓ | | ✓ | | |
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| 12-character Alphanumeric Display | ✓ | | | | |

*Comparison made by Prometheus on the basis of the best information available to Prometheus at time of printing.

CIRCLE 122 ON READER SERVICE CARD

Tim's legs recede into his torso, and his torso retracts into his head. Finally, Tim's head changes into the spider's body and the transformation is complete. The newly devolved spider dances on the ledge.

**Should Dino Mom actually pulverize you, you become a blue-and-white pile of mush.**

The score, the biological time-bomb timer, and various messages are easy to spot and read. The messages tell you what's occurring on the screen. For instance, when you bring eggs into the time warp, a message at the bottom reads Warping Out. When you return, it says Warping In.

Other messages include Start Fire, Dino Mom Coming, and SMASHED. Should Dino Mom actually pulverize you, you become a blue-and-white pile of mush.

The sound effects are as good as the graphics. Baby dinos' chirp, a high-pitched medley of notes, accompanies Tim as he warps in and out, and a doleful melody signals Tim's death.

The rules are fairly complete, if a bit terse, but at least they warn you that you will learn how the cliff features interact as you play. For instance, the instructions fail to mention that you can run off one side of the screen and reappear on the other.

You can pause the game during play and toggle the sound on or off. High scores are not saved on disk. You may use a joystick with an Atari-type joyport in place of the two-button Apple joystick.

Dino Eggs appeals to a wide age group. The first few screens are pretty easy for adults, success depending more on paying attention to a few snakes and spiders than it does on frantically jumping and weaving. Younger kids may find the first few screens sufficiently challenging.

As you progress through the levels, the game becomes a blend of cold, calculating strategy and instinctive arcade action. Adults find themselves hard-pressed to transport all the eggs. More and more baby dinos hatch, forcing you to cage them, while Tim receives a greater number of bites.

The last few screens represent true arcade excitement, as joystick jockeying eclipses strategy as the number 1 method of staying alive. I managed to get to level 8, but only by gritting my teeth and using a lot of body English. Fortunately, the game rewards you with higher scores the more times you play.

Dino Eggs warps you into the future of entertainment programming with an exciting and challenging arcade game. It wraps you in color and sound while tickling your primeval instinct for daring and thrilling fun. The dinosaurs lived in the past, but Dino Eggs should be in your future.

*Russ Lockwood*

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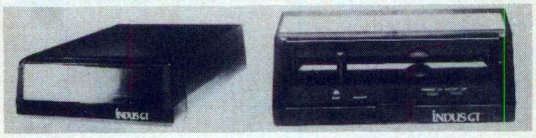

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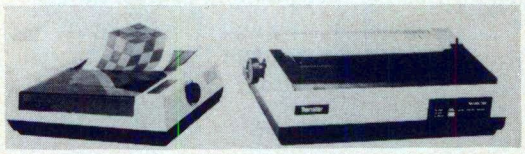

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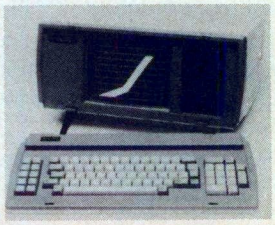

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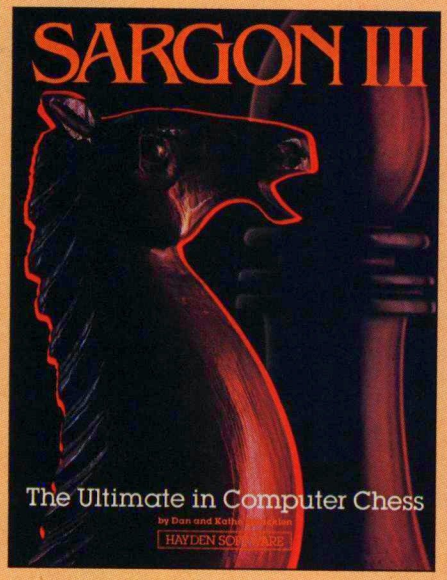
# ENTERTAINMENT

Playing chess with Sargon III is not like playing the common "toy" variety of computer chess games in which you pick up and put down pieces with a joystick and a firing button. The Sargon concept is professional and adheres to standard chess conventions. After you boot the program disk, you choose between two displays that you produce using the Escape key. One display is a text screen; the other is a high-resolution game board. The game board follows standard chess practice: it has eight ranks and eight columns of squares and is numbered 1 through 8 from bottom to top for the ranks and lettered A through H from left to right for the columns.

**You easily recognize the chess pieces on the game board.**

You address each square by its coordinates; for instance, the white queen sits on D1 and the black king rests on E8. You easily recognize the chess pieces on the game board. You should view the graphic display on a black-and-white or green-and-white monitor. You gain no advantage with a color monitor. In fact, the display looks worse on a color monitor, because convergence problems cause color impurities. Perhaps someday software authors will include a software switch so that you can choose either an optimized black-and-white or a color display.

When you press the Escape key to get the text screen, you see three columns: a play (move) number, your move, and Sargon's move. To make a move, you type the coordinate of the square you want to move from, a space or a dash, and the coordinate of the square you want to move to. Thus, if you want to start the game by advancing your king's pawn two spaces, you type E2-E4. You can't make an illegal move, such as E2-E5; Sargon would recognize it, beep at you, and you would have to reenter. After you make your move, Sargon makes its move, and so the game progresses. While playing, you watch either the board or the list of plays on the text screen. When you type in your move on the graphics screen and press Return, the square you are moving from "blinks" (alternates between normal video and inverse video) a few times, the square you are moving to blinks, and the chess piece moves from the old square to the new.




You can use control keys to access desired features directly, without bailing out of the game. You press Control-N (new) to terminate the present game and start a new one. You press Control-S (sides) to change sides. At the beginning of each game, Sargon automatically assumes that you want to use the white pieces and move first. At any time during a game you can play the black pieces. In fact, by pressing Control-S on each move, you can watch the computer play itself, playing first white, then black, and so on. You press Control-I (invert) to turn the board upside down so you can see what the pieces look like from your opponent's viewpoint. You change colors and sides using two separate keystrokes; they are not combined as in some other chess games. This is a desirable feature, because many times you might want to change one but not the other.

If you play chess long enough, you get into situations in which you wish you could backtrack, that is, take moves back. With Sargon, you backtrack by pressing Control-B (back). You can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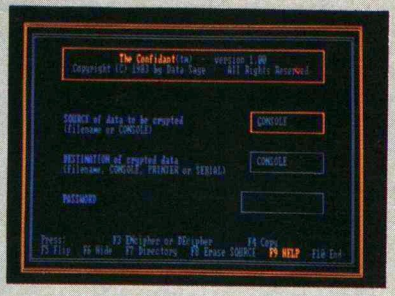

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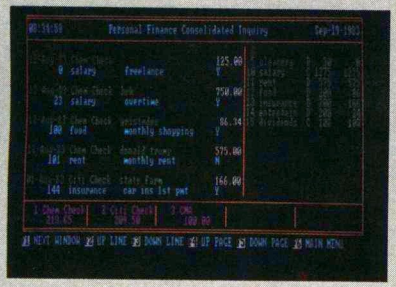

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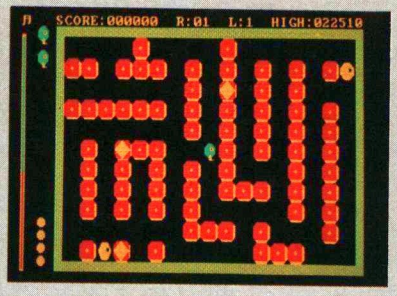


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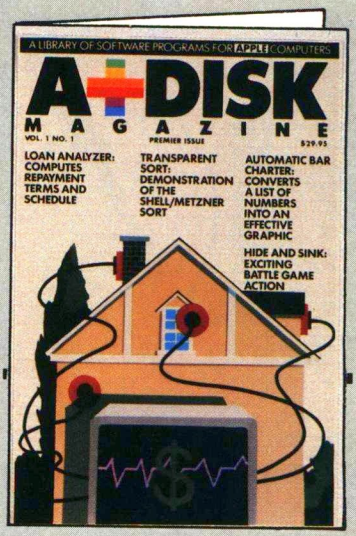


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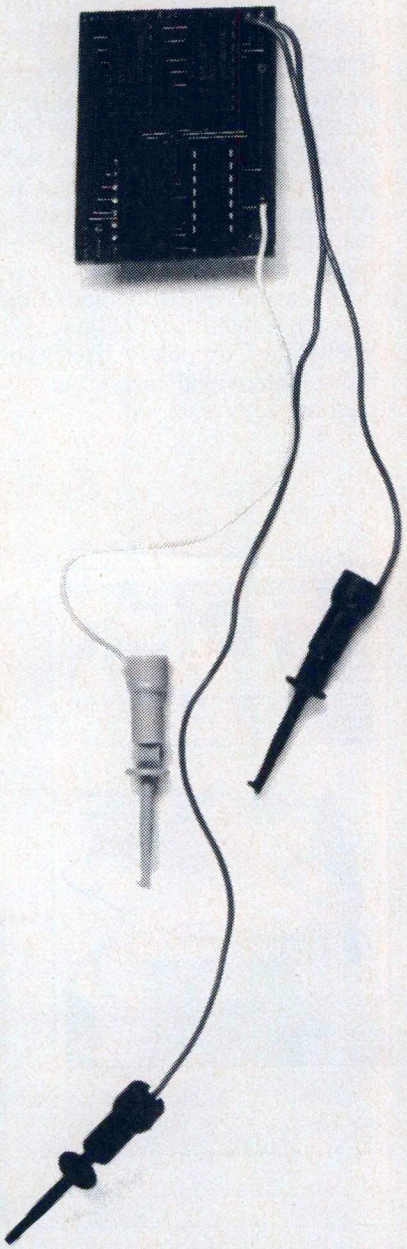

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take back as many moves as have been played in the game, all the way back to the initial position. Control-O (offer) is an interesting key. Press it and Sargon suggests your next move. If you get stuck and need a kibitzer, this is the key for you.

Sargon III has nine different levels of play (Sargon II has six). You choose the levels by pressing Shift-1 through Shift-9. The numbers refer to the number of plays ahead that Sargon is planning. Thus, if you are on level 1, Sargon is planning no further ahead than its next move. Level 2 means that Sargon is planning its next move, anticipating what you might do in response, and then planning how it will react to your response. Naturally, the time Sargon takes to respond to your move is based on the level you ask it to play. The period lasts from five seconds per move on level 1 to no limit on level 9. At level 8, the average response time is almost seven hours. You can change the level of play at any time during the game. You press Control-T (terminate) to force Sargon to stop searching and make its best move. You press Control-J (sorry, but W is used for something else) to acquire a "window" on Sargon's search. You watch as Sargon goes through its "thinking" process and displays all its options. You learn if Sargon anticipates winning or losing. Chess pieces have point values (a pawn is one point, knights and bishops are three points, a rook is five points, and a queen is nine points), and Sargon tallies these values as it looks ahead. A positive number indicates that Sargon is winning; a negative number indicates that Sargon is behind.

You can effectively double the number of skill levels by using the Control-E (easy) feature. Normally, Sargon III uses the time you think about your move to plan its next move. Thus, if you select level 1 (five seconds per move for Sargon) but take two minutes to choose your next move, Sargon uses your two minutes to plan its reply. In effect, Sargon is operating at a much higher level due to your slowness. When you invoke Control-E, you prevent Sargon from using your move time for its own purposes.

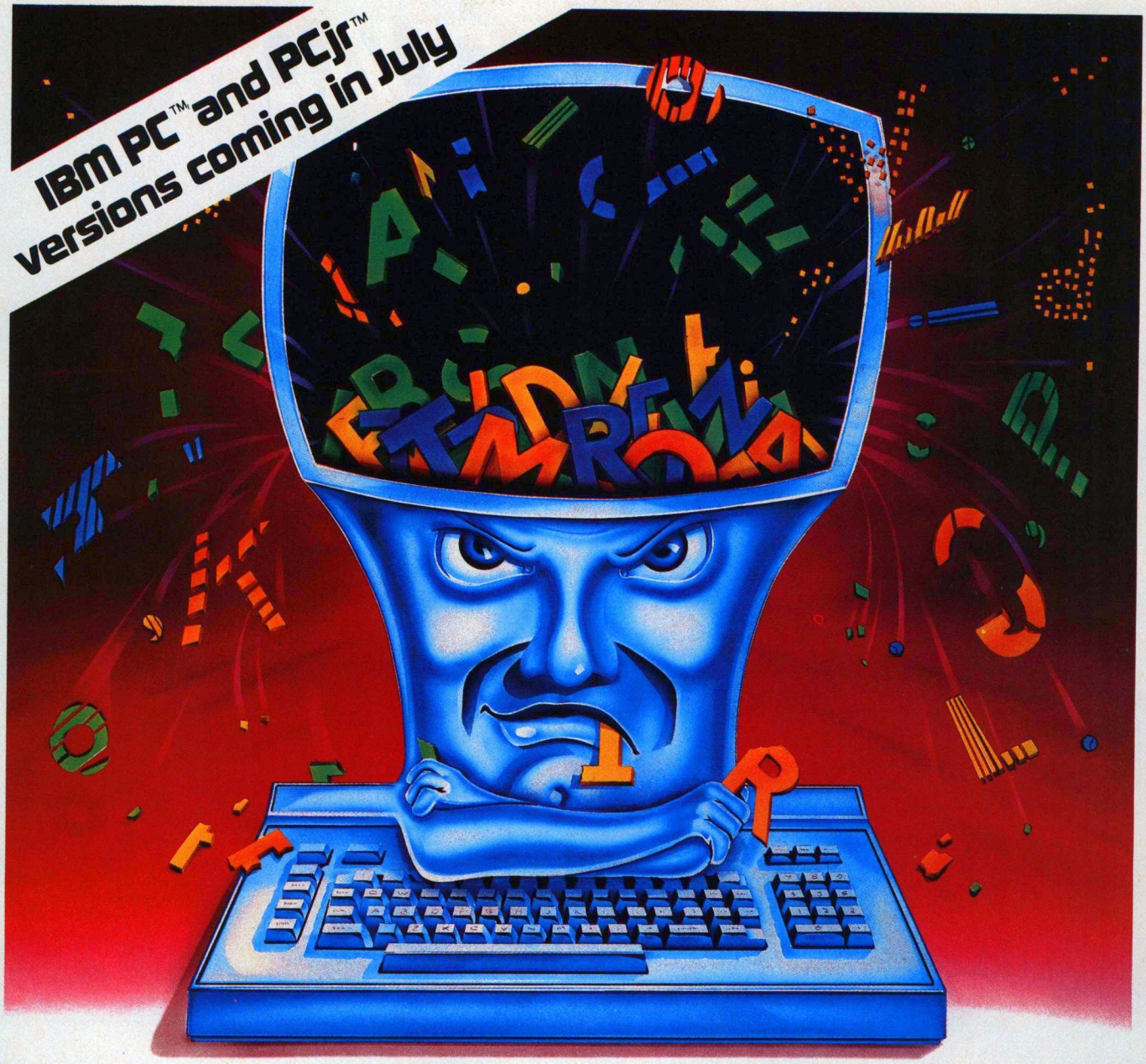
If you want to take a break from the game and review what you've done, you press Control-R (review) and follow the entire game from the beginning. Maybe you'd like to take a new direction early in the game. When you reach that point, you press Control-X and resume play.

**You can go to the 1959 game between Fischer and Zageb, in which Fischer carelessly grabs a couple of pawns on his 20th and 21st moves.**

In addition to playing the game and utilizing the various control keys, you can perform some utility functions. You press Control-G (game) to save the current game in memory on any disk file you name. You press Control-P (print) to print out a list of moves on the printer, and you press Control-W (write) to make Sargon print the current board position. I expected a graphic dump, but the computer merely prints out a crude grid with appropriate letters in the squares, such as WQ for "white queen." You can also load previous games, including the 107 famous games, from a disk to review the moves or pick a point in a game to resume play with Sargon. Imagine! You can go to the 1959 game between Fischer and Zageb, in which Fischer carelessly grabs a couple of pawns on his 20th and 21st moves, and take over for him to continue the match against Sargon.

As if these features aren't enough for your $49.95, Sargon includes a series of chess workshops on disk. With them Sargon drills you on opening moves, tactics, strategies, and checkmates. Unlike Sargon II, version III beefs up its manual with basic rules of chess so that a rank amateur is not left out in the cold. The package even offers Sargon III owners the chance to join the U.S. Chess federation and receive its monthly journal, *Chess Life*, at a substantial discount.

*Marty Peterson*

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Now compatible with Lotus 1-2-3

**GAME FEATURE**

# OF MICROS AND MYSTERIES

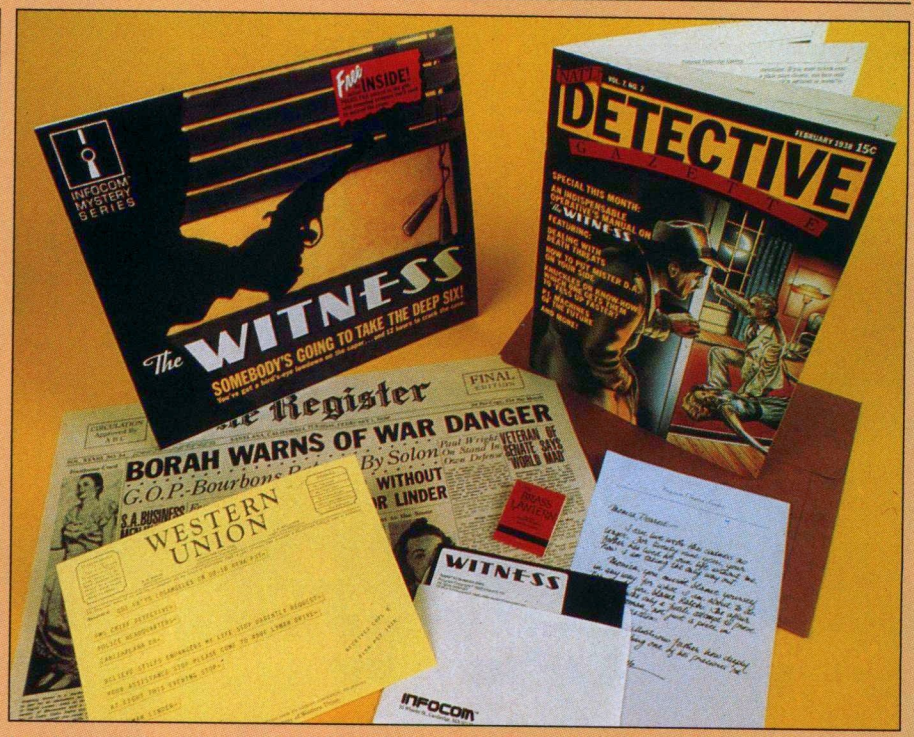
## Hard-boiled entertainment, not for the faint of heart

It's 1939. Outside, it's as black as a landlord's heart, the wind is howling like a beaten cur, and the streets of Los Angeles stream with an unseasonable rain. Inside, a family huddles in the living room by a roaring fire, immersed in *The Big Sleep*, a powerful tale of murder and intrigue by a new voice on the crime-fiction scene, the master of metaphor, Raymond Chandler.

As any murder-mystery enthusiast could tell you, the 30s and 40s were a golden era for the genre. True, there were earlier classics such as Edgar Allan Poe's stories featuring detective Arsene Lupin and Sir Arthur Conan Doyle's tales of the exploits of Sherlock Holmes and Dr. Watson. But few mystery buffs would deny that the Depression Era had a special affinity with the detective.

**Outside, the sun is as dazzling as a chorus girl's smile, and the air is as still as a stiff.**

In the England of her day, Agatha Christie was busy earning fame as the "Queen of Crime," churning out genteel murders involving locked rooms and village functions, as well as more lurid slayings featuring obscure poisons, improbable pacts, and exotic locales. Avid readers thrilled to the exploits of her two most famous sleuths: Hercule Poirot, the Belgian detective who abhorred motion, preferring to relax in an armchair and "let the little grey cells of the brain" do his legwork; and Miss Jane Marple, the elderly spinster whose life in a tiny English village had prepared her for the evils of a less confined sphere.




Meanwhile, murder mysteries in the New World were made of sterner stuff. Men such as Dashiell Hammett and Raymond Chandler wrote tales of tough-talking private detectives who dealt masterfully with Los Angeles' sordid underworld, loners who owed no favors and granted none. They wrote of losers, con men, grifters, and tough dames—with and without hearts of gold . . .

**It's 1984**

Outside, the sun is as dazzling as a chorus girl's smile, and the air is as still as a stiff. Inside, a family is gathered in the living room, immersed in The Witness, a new mystery by Stu Galley. His writing bears a distinct resemblance to that of Chandler; the story is set in the 30s, everyone talks tough, and metaphors abound. In some ways, little has changed in nearly 50 years, except that The Witness isn't a book—it's an interactive computer program.

The Witness (reviewed in a previous issue) is, in fact, the second mystery in a series from a company called Infocom, a rather unlikely group to breathe new life into the classic mysteries of the 30s and 40s. Whereas Raymond Chandler was a journalist, RAF pilot, and oil-company director, and Dashiell Hammett actually worked as a detective for the Pinkerton Agency in the 20s, a little sleuthing into the past reveals that The Witness is the product of a physicist from the Massachusetts Institute of Technology. As if that weren't enough, further investigation tells us that Infocom's first mystery, Deadline, was written by a doctor. The doctor and the physicist gave up their first callings

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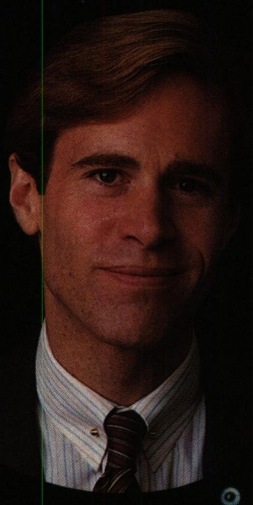

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**Literary Software**

The "author" notion is not as far-fetched as you might think. The new generation of computer mystery software resembles previous computer adventure games, but with some important differences.

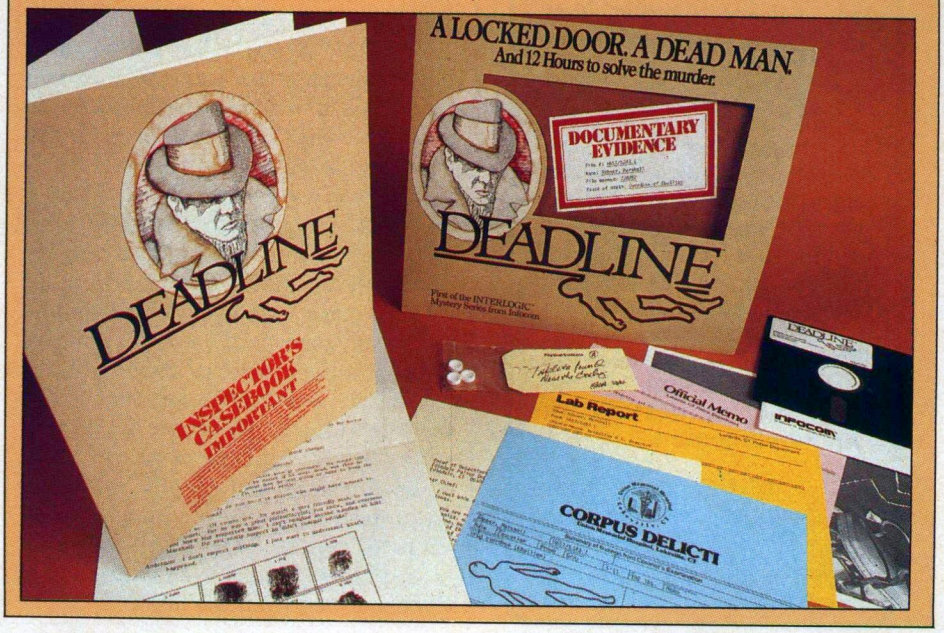
Early adventure games usually involved the player in some sort of quest, perhaps for treasure or to save a planet from destruction. Users controlled the action on their screen by typing in simple commands. These commands were generally composed of one or two words; for example, North (meaning that the character should move north), Take ax, or Chop tree. The adventure scenario was set, the player was the only character with any variability, and repeating an action later in the game would call forth the same response from the program.

In some of the new software mystery games, however, players have many more options. Thanks to Infocom's advanced parser, a program that dissects sentences written in English and interprets them in language a computer understands, aspiring computer detectives aren't nearly as limited in their choice of phrases. Infocom's programs—and other software mystery games—can handle commands containing a subject, verb, and direct object. Thus, rather than sitting at the keyboard feeling like a throwback to prehistoric days, typing out grunts like Get stick and Make fire, you can address the characters in a relatively civilized manner. Mrs. Robner, tell me about Mr. Baxter. Ms. Dunbar, where is the book?

Not only is communication more civilized, but the characters behave with a little more of the unpredictability that enlivens fiction—and life, for that matter. The programs are constructed so that characters' responses are dictated by your previous actions. For example, an early accusation may bring a response such as, You haven't got a clue and you know it, whereas an accusation coming after the discovery of more facts may elicit a partial confession.

**Up Against the Deadline**

As someone whose vocation is writing about computers but whose avocation is reading about murders, I found the interactive-mystery concept to be both a logical outgrowth of past games and a stroke of creative genius. After sitting passively through what must have been thousands of literary slayings, forced to rely for information on whatever detective was on hand (and on the kindness of the author), I was anxious to take a more active role.



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I could hardly wait to get my hands on Deadline, to begin grilling suspects, casting footprints, analyzing ashes, and the like. Having read more mysteries than could possibly be good for me, I saw myself as a natural at computer detecting.

**Deadline is set in the present day, but its elements are timeless; a locked room, a dead man, a grieving widow.**

As I hastily unwrapped the evidence (Deadline comes with transcripts of relevant questioning, a picture of the position in which the body was discovered, a coroner's report, samples of the poison, and more) and booted the disk, I pondered all the lessons that I had absorbed from those long hours of misspent reading. Agatha Christie had taught me to suspect the most unlikely person; from Sherlock Holmes I had gleaned the maxim that "If you eliminate the impossible, the remaining explanation, however improbable, must be the truth"; and from the hard-boiled detectives, I had learned to trust no one. I was ready for anything.

Deadline is set in the present day, but its elements are timeless: a locked room, a dead man, a grieving widow (or *is* she grieving?), her shiftless son, the dead man's oh-so-private secretary—there's even a garrulous cook ("There I go, shooting my mouth off again."), an elderly and cantankerous Scottish gardener ("Hey, quit mucking about the roses.") and, of course, the stuffy family lawyer, concerned only with appearances and the provisions of the will.

The player is cast as the chief of detectives, called in for assistance on this rather suspicious case of suicide. Mr. Robner, a noted industrialist and philanthropist, has been found dead, sprawled on the floor, a bottle of pills spilled beside him in—you guessed it—a room bolted from the inside.

His lawyer, Mr. Coates, professes belief in the preliminary finding of suicide, but is disturbed by the fact that the dead man had been talking of changing his will only three days earlier. Coates believes that a more thorough investigation is necessary in order to "quash the suspicions that are inevitable in these circumstances."

In addition to providing physical evidence, Deadline comes with an "Inspector's Casebook," which provides invaluable information on the nuts and bolts of using your Apple to investigate a case of suspected homicide. You learn how to do the legwork, handle evidence, deal with suspects, and much more. The section explaining the how to's of computer criminology is followed by a glossary of terms common in criminal investigations.

**'The Game Is Afoot, Watson.'**

Although a friend suggested that I model my detective behavior on that of Rex Stout's Nero Wolfe ("*He* solved all his cases from an armchair."), I preferred to approach the game as a modern-day, female version of Dorothy Sayers' aristocratic sleuth Lord Peter Wimsey. Intelligent and urbane, I didn't *have* to detect, but I couldn't resist a puzzle.

This attitude lasted perhaps five minutes, until the first character I encountered simply walked away from me and I had my first run-in with the game's limited vocabulary. Even though I'd been yearning to play an active role in a detective adventure, within minutes I found myself longing nostalgically for the inevitability of a book with a murder that would be solved no matter what I did.

My first reaction was surprise. My second, renewed determination. No computerized crooks were going to get the best of me. If I had to play by their rules, so be it. I shifted my role model from Lord Peter to Sherlock Holmes ("Come, Watson, the game is afoot."), with just a touch of a Canadian Mountie ("They *always* get their man."), and launched myself back into the world of Deadline.

For the next few hours, I was completely involved in the story. My body

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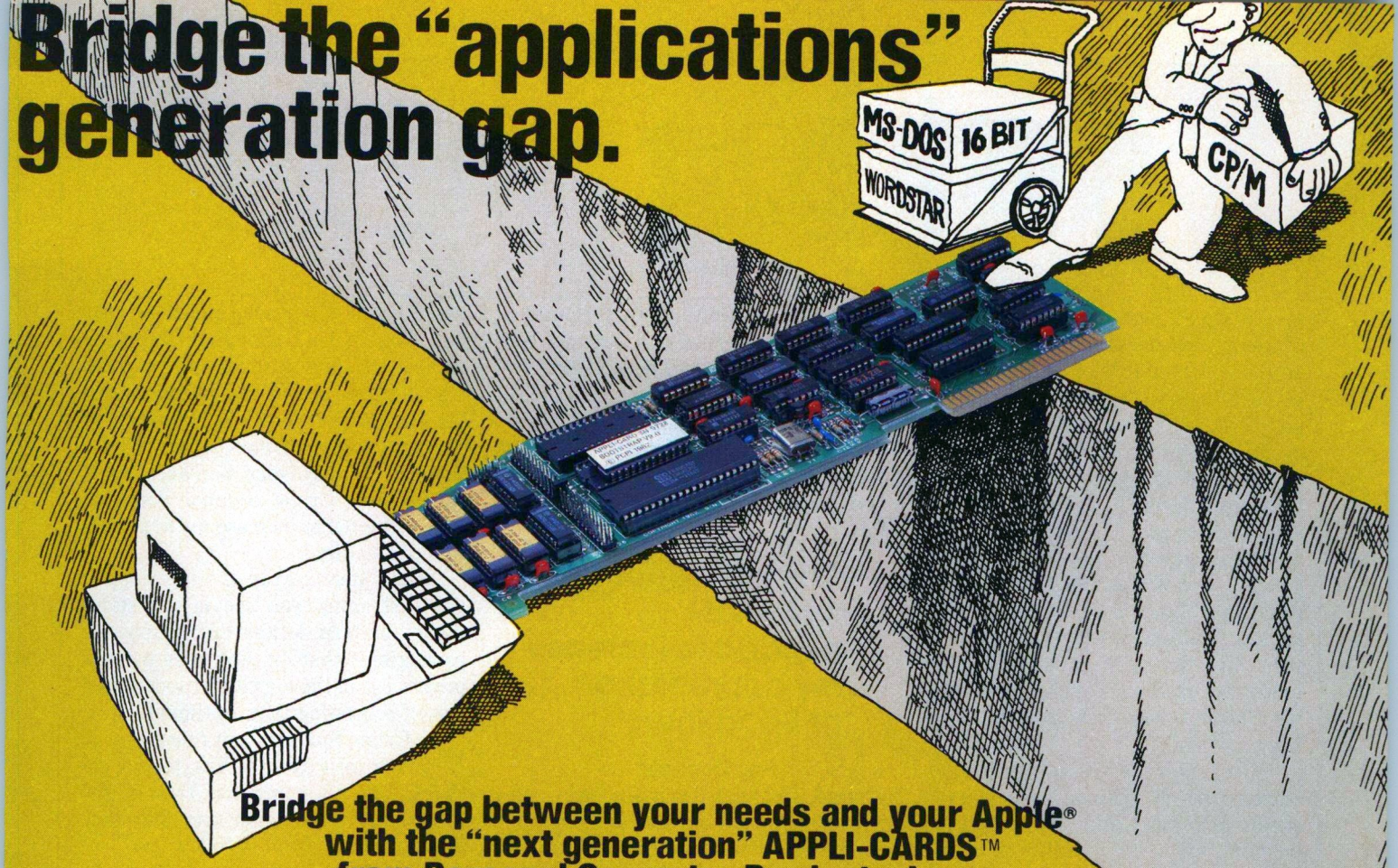


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was sitting at the keyboard of an Apple computer, but my attention was riveted on the events unfolding at the Robner home. I "cased the joint," mapping my progress to facilitate later movement. I examined the scene of the crime in what turned out to be a vain attempt to fathom the locked-room mystery. With the aid of Sergeant Duffy, the electronic Watson Infocom provides, I fingerprinted objects that might have been significant, analyzed suspicious substances, and quizzed the characters on their impressions of each other. I attended the reading of the will, carefully scrutinized the suspects' reactions, and I got nowhere.

What could be wrong? Surely my background in fictional investigation should help me. Calling on what I had believed was a vast treasury of experience, I came up with only one locked-room mystery, a Sherlock Holmes story called "The Adventure of the Speckled Band." Unfortunately, it seemed unlikely that Robner had been killed by a poisonous snake introduced into the library through a ventilator shaft. Talking to friends who admitted—under questioning—that they had fared no better with the mystery was cold comfort.

**Crime Stopper was just what I needed to increase my appreciation of Deadline.**

**I Turn to Crime (Stopper)**

Had Deadline been the only software mystery available at the time, my computer-criminology career might have ended with frustration and wounded vanity. I was willing to admit that it was a remarkable game, but that fact alone wasn't enough to keep me playing Deadline without any progress. Unwilling to accept the demise of my detective career, however, I turned to another computerized caper, Crime Stopper, from Hayden Software. As it turned out, Crime Stopper was just what I needed to increase my appreciation of Deadline.

When you unwrap Crime Stopper, the first thing you see is the statement—in bold letters on the outside packaging—that "it ain't easy being a private eye in the big city." I soon found myself seconding that sentiment.

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and another suit. You come from a long line of private investigators and you seem to have inherited your family's ability to smell out trouble. In fact, it almost seems to sniff you out. Maybe it's your cologne.

According to the package and the program's only documentation—a tiny, two-page booklet—you are three months behind on your rent, and your secretary is gone. Seated at a scratched wooden desk in your dingy, rundown office on the third floor of the Consolidated Acme Building, you contemplate an unopened telegram in front of you.

Suddenly, the phone rings. You jump at the sound, a ringing noise coming from your computer. When you type in the command Answer phone, the ringing stops. On the other end of the line is Cartier-Blanche Sizemore, a young heiress who is in considerable distress. According to your program literature, "She's got reason to scream; she's been kidnapped."

You read the telegram (and the package) and find that Ms. Sizemore's mother, Millicent Hyacinth Sizemore, had anticipated the crime and wants to hire you to get her daughter back. You are to go to the lobby of the Sizemore building on the corner of 2nd Avenue and 50th Street and await further instructions.

Venturing out of your office and into the streets of the city, you soon encounter the game's primary challenge, the subway. Crime Stopper, like Deadline, has a 12-hour time limit, and you'll be amazed at how many of those hours you spend underground, snarled and delayed in the city's maze of anything-but-rapid transit. A subway map is provided, though, and the prudent detective will take heed of this offering.

Once and *if*—I'm not kidding about the subway—you make it to the Sizemore building, you're in for a disillusionment. Conversing with the characters in Deadline is challenging and fun, but the people in Crime Stopper will barely give you the time of day. Even your client forgoes a personal appearance, passing her instructions on to you by proxy. Not until an hour of real time (roughly six hours of in-game time) passed did a character finally almost converse with me. He wouldn't respond to direct questioning, though. All I could do was make like a private detective and shovel money at him in return for information.

**Venturing out of your office and into the streets of the city, you soon encounter the game's primary challenge, the subway.**

This lack of interaction is not the program's only limitation. Crime Stopper strictly limits your movement. Often, you can proceed in only one direction from a given location. For example, at one point, having gotten my bearings from assiduous examination of the subway map, I wanted to walk from one location to another and take in the sights. The program insisted that I descend into the subway again. And, though the literature speaks of an abundance of clues, most of the places in which you find yourself are devoid of visual interest. Crime Stopper offers little interaction, few choices, and scant scenery.

The program does offer some imaginative touches though, such as the audible telephone ring, a DON'T WALK sign that flashes on and off on your screen, and a safe that you can open by listening to the tumblers click into place. These features enrich the adventure and suggest interesting possibilities for future games.

I eventually finished mapping out the game's entire area and decided to set out to Wait. This time, however, I waited in the sun out on my back porch, rereading *The Big Sleep*.

**What Next?**

Just as a mystery aficionado in 1939 would have had trouble envisioning fictional computer sleuthing circa 1984, the computer criminologist of today finds it hard to look ahead. One thing, though, seems obvious: The limits of today's games will continue to be stretched. At this point, investigating a software mystery is a laborious process.

For example, Deadline's working vocabulary contains only 600 words, and Crime Stopper's is even more limited. In Crime Stopper, when you use a word outside its vocabulary, the program merely responds, I don't know the word _____. Deadline's author has gone a step further and thoughtfully provided a variety of clever responses to requests that fall outside of the game's interpretive capabilities. It is still possible, though, to receive such unintentionally humorous responses as I don't understand the meaning of the word 'vocabulary,' or, even better, I don't know the word 'don't.'

So, Dick Francis and P.D. James, you don't have to worry about being supplanted by computers—at least not yet. Exercising my inductive reasoning powers, I expect to see mystery software moving closer to conventional fiction, with ever-broader vocabularies, and offering more scenarios. Eventually, fictional computer detection should be not only as absorbing but also as easy as reading a good mystery.

*Anne Kaplan*

## PRODUCT INFORMATION

**Witness and Deadline**
Infocom, Inc.
55 Wheeler Street
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**List Price:** $49.95 each
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**Crime Stopper**
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Lowell, MA 01853
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some solid choices

# THREE HOME WORD PROCESSING PROGRAMS

Shopping for a word-processing program for home use has suddenly become similar to shopping for a familiar appliance such as a toaster or a washing machine.

Because of the features most authors now build into their programs to make them easy to use, learning to use word-processing software shouldn't be much more difficult than learning to use a washing machine. Although both types of products come with instruction manuals, you can almost do without them, except for the most complex functions.

All you really need to decide before buying either type of product is how much money you want to spend and what features you need. Nevertheless, the choice is not an easy one.

Just as you might have to decide if you need one, three, or five wash cycles in addition to 4 or 16 different temperature settings on your washer, you will face a similar myriad of choices when you pick a word-processing program.

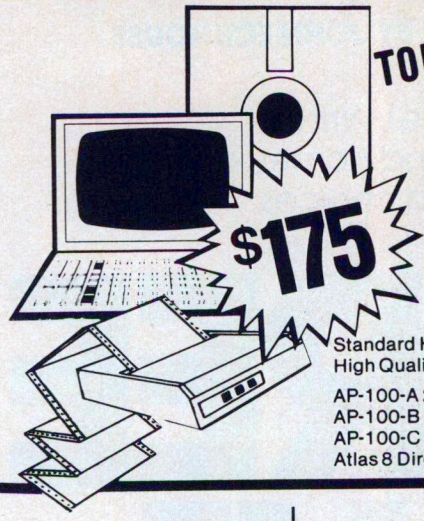
For example, do you need to underline and boldface words when you write? Is the ability to create an outline with a single keystroke a must? Do you prefer using the arrow keys to move the cursor around on the screen, or does it make more sense to you if the arrow keys are for erasing words? Would you like to use icons—screen symbols such as a picture of a printer or file cabinet—to help you perform a function such as inserting a paragraph in a page of text, or are you just as comfortable typing a command such as Control-P for that chore?

These choices actually confront buyers of the three home word-processing programs reviewed here. To make a selection among the products, you need to consider not only what features you need, but also your own individual writing style and the way you prefer to work with your computer. Indeed, the determination of which features feel most comfortable for you probably will be the primary factor that helps you select a program to buy and use.

To see what products you have to choose from, let's take a look at each of the three programs.

**Bank Street Writer**

Bank Street Writer has been around for quite a while, but few other programs can compare in simplicity and



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ease of use. A teacher friend of mine uses it to teach her first-grade students how to write short letters, and the children seem to have little trouble with the program.

Although the program comes with a 35-page manual, if you have some familiarity with a computer and word processing, you can probably skip the manual because all the commands are on the screen.

If you want a quick guided tour of the program, insert the reverse side of the program disk and take advantage of the tutorial section you'll find there. Within 15 minutes you receive five lessons on entering text, moving the cursor, erasing mistakes, moving words, and using the Find and Replace function.

Bank Street Writer displays text on the screen in a box that measures 38 columns by 18 lines. The program has three modes, Writing, Editing, and something called the Transfer mode, which you use to save, retrieve, delete, or print files. Each mode has its own menu at the top of the screen.

To select a particular mode, you use the open-apple or closed-apple keys and then press the Return key. Screen instructions then guide you through various functions, such as moving text or printing.

A major drawback for experienced computer users is the way Bank Street Writer uses the Apple's arrow keys. Rather than using them to move the

**If you have some familiarity with a computer and word processing, you can probably skip the manual.**

cursor about the screen, the program relegates them to deleting text. Thus, I erased more words than I care to admit when I first used the program.

To move the cursor on the screen, you have to exit from the Writing mode by pressing the Escape key. Then you can use the arrow keys to move the cursor, but you must go back to the Writing mode to insert text.

A novelty my seven-year-old son enjoyed was the ability to give his personal files a password, after which only he could retrieve the protected files from the disk.

Just in case your youngster decides to lock up one of your important docu-

ments, however, there is a way to order the program to reveal passwords for each file. By pressing Escape while the program is loading, you enter Bank Street Writer's utility program. Besides revealing secret passwords, this program lets you change more than two dozen defaults, such as top and bottom page margins, turning a keyclick on and off, and specifying the slot in which your printer is connected.

To keep Bank Street Writer simple, the program's author kept the utility program hidden from casual users. Bank Street Writer's simplicity is a double-edged sword, however. Although ideal for youngsters and novice computer users in the home, the program lacks many of the more powerful features serious writers might demand from a word-processing program.

Here are a couple of examples: it can move only 15 lines of text at a time and cannot move text between files. In addition, Bank Street Writer lacks the ability to boldface or underline text.

**Cut & Paste**

If you absolutely need to move large chunks of text around in your documents or between files, you might prefer Cut & Paste. A relatively new program—so new, in fact, that I found typographical errors in the instruction manual—it resembles Bank Street Writer in its attempt to provide ease of use. Both products offer a limited number of functions, perhaps because of the premise that too many choices would ruin a home writing program, but Cut & Paste packs more power.

Cut & Paste offers a full 80-column-by-21-line display, for example, and had no problem when I tried to move 87 lines of text from one file to another. Although editing functions such as deleting or moving text are menu-driven as with Bank Street Writer, Cut & Paste offers advanced users the option of skipping the menus to save time once they master the techniques.

To move a paragraph, using the menu, for example, you first mark it by pressing Control-A ("anchoring" the words) and the arrow keys to highlight the passage. Then you press Escape to reach the menu choices on the bottom of the screen, use the arrow keys to highlight the function marked Cut and then press Return to activate the command, which puts the highlighted material into the memory buffer.

Now, using the arrow keys, you move the cursor to the new location for the passage. Then you press Escape again to reach the menu on the bottom


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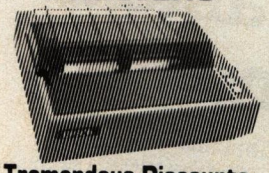

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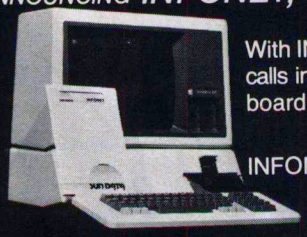

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line of the display screen. Using the arrow keys to select Paste, you press Return, and finally the paragraph moves to the new location. To end the procedure, you type Control-A again to turn off the highlighting.

If you're an advanced user, you can skip through most of the steps after they highlight the paragraph to be moved, with the Control-A command. Then you need only press Control-C to cut out the passage and Control-P to paste it into its new location.

Cut & Paste does not offer an on-screen tutorial, but you'll need to work with its brief 14-page manual for only

**HomeWord tries to confront the ease-of-use challenge by employing screen symbols called icons.**

20 minutes or so to get going. The program informs you gently if you are about to make a fatal error.

Once, I forgot to save some changes I'd made in a document, and the program warned me You haven't saved your changes on the top line of the screen. At the same time the bottom line reminded me to select the Document choice in the menu to reach the Save command.

Although Cut & Paste does not let you know where one page ends and the next begins, it does offer a function that newspaper reporters and printers will enjoy. The program automatically eliminates "widows" and "orphans," printers' terms for one-line paragraphs left at either the top or bottom of pages.

**HomeWord**

HomeWord offers a bit more versatility than the other two programs. Although it strives to be easy enough for home use, the program also includes most functions that a user might want in an office.

Besides offering boldfacing and underlining, which the other two programs lack, HomeWord also permits you to print justified text (flush right and left, as on this page of *A+*), automatically align indented portions of an outline, insert a previously saved file into the document on the screen, or see on the screen exactly how a document will look when it's printed out on paper.

That's a lot of power for a home word processor that claims to be easy to

master. HomeWord tries to confront the ease-of-use challenge by employing screen symbols called icons to walk novices through its editing choices.

For example, when you boot the disk, the upper two-thirds of the screen remains blank, and the bottom third contains six icons: a printer, a piece of paper with writing on it, an open file cabinet, two pieces of paper with an arrow pointing from one to the other, something that looks like a floor indicator from an old department-store elevator, and a floppy diskette.

This set of symbols is the menu of function options. You use the left- and right-arrow keys to move from one icon to the next and press Return to select your choice.

You use the Print icon not only to print, but also to preview the text, specify single-sheet or form-fed paper, and indicate a beginning page number. Selecting the piece-of-paper symbol gets you into the Edit mode, for moving text, searching and replacing, and the like. The file-cabinet symbol permits retrieval, storage, and merging of documents.

The two pages of text with an arrow going from one to the other signify the layout options, such as spacing, margins, headings, and footings. The "elevator-floor indicator" represents a command called Customize, which changes the default margins, and tells the computer the type of printer card you have and how many disk drives you are using.

The diskette represents utility functions such as initializing a disk, erasing files, and getting a catalog of all files on a particular diskette.

When you select an icon, you find yourself confronted with a subcategory of icons. For example, if you select the Print function, four new icons appear.

To make sure novices are not too baffled, HomeWord comes with a handy 30-minute cassette-tape tutorial, which I highly recommend.

On the other hand, what about advanced users? Although you cannot eliminate the icons on the screen, you can memorize a few arcane commands and avoid having to use the symbols.

I particularly like the ability to move the cursor rapidly around a page of text, something the other programs don't offer. For example, Control-E moves the cursor ahead one word, Control-Z or Control-J ahead one line, and so on. Experienced typists may also appreciate the ability in HomeWord to turn off the Insert command and actually type over letters in a document by


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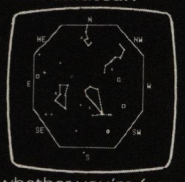

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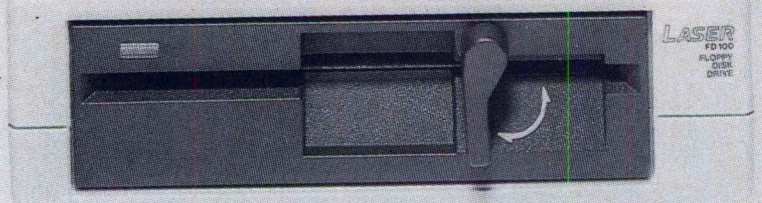


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pressing Control-C. Pressing the same two keys again restores the Insert mode.

The program does have some drawbacks. First, the work area is fairly small compared to that of Cut & Paste. Because the icons take up space, HomeWord offers a display of only 40 columns by 15 lines.

I also feel the authors overdid the use of the icons. The program has too many, and I am not sure how understandable they are. They confused my seven-year-old, for example, who does not have a lot of experience with filing cabinets and text layout. By permitting advanced users to ignore the icons, however, HomeWord does offer something for everybody.

**Users' Choice**

Which of these three home word-processing programs is right for you? For your Aunt Bee? For your spouse? The answer depends primarily on personal taste and preference. Although I, as a professional writer, would never be satisfied with Bank Street Writer, for instance, it is ideal for other members of my family.

All three of these programs are fine pieces of software for your Apple. Each of the three has strong and weak points, as I have described, and are all quick and easy to learn.

The difference among them, as I have indicated, is the amount of power and functionality they offer. +

## ▶ PRODUCT INFORMATION

**Bank Street Writer**
Brøderbund Software
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170
**List Price:** $69.95
**Requires:** Apple II, II Plus, or IIe; 48K RAM; one disk drive; Applesoft

**Cut & Paste**
Electronic Arts
2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171
**List Price:** $50
**Requires:** Apple IIe; one disk drive

**HomeWord**
Sierra On-Line, Inc.
Sierra On-Line Building
Coarsegold, CA 93614
(209) 683-6858
**List Price:** $69.95
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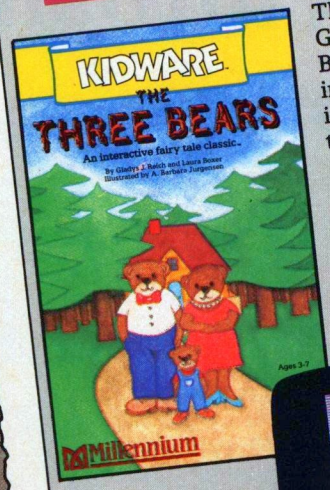


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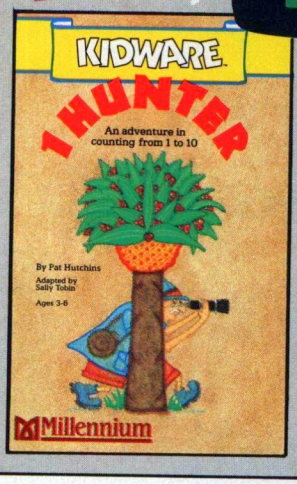


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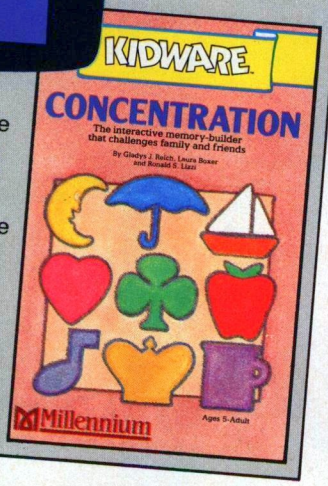


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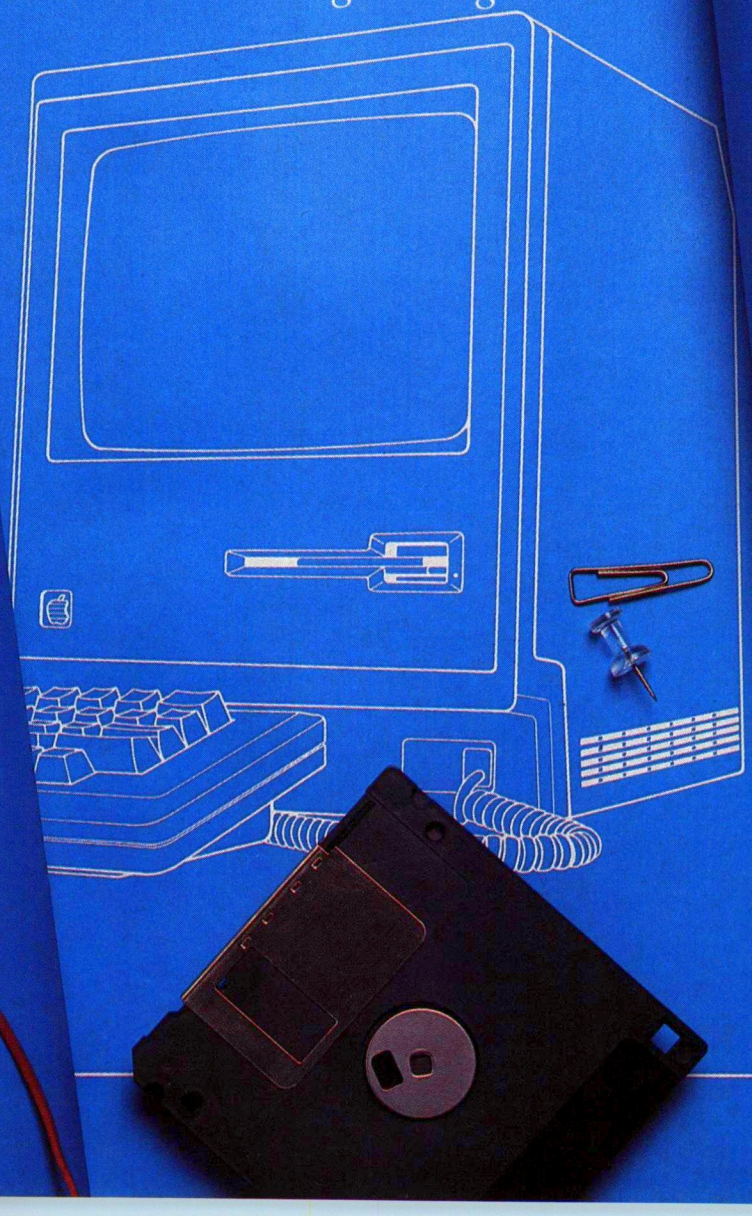

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# Building Microsoft Programs for the Mac

*A look at Multiplan, Chart, and Word*

Microsoft programs and the Macintosh computer should prove to be an exciting combination. As the new kid on the block, the Macintosh still has the task of having to prove itself, and what better way to begin than by teaming up with one of the best software developers?

Microsoft's Multiplan, Chart, and Word are now available. As some of the first third-party software designed for Macintosh, these programs are good candidates for an examination of what could be called the "Macintosh promise."

**Basic Principles**

Before delving into the applications, let's review some basic Macintosh principles that apply to all of them. Most notable are icons, the mouse, and pull-down menus. I could be just as happy with words instead of pictures. The "point and click" approach means you use the mouse to move the cursor to an area of the screen, click the mouse button to select something, and then go to the menu and choose an action.

This combination of mouse and menus is excellent and simplifies computer use considerably. Eliminating the old "grid" approach (arrow key down three lines, arrow over 16 characters) is a real advantage that saves keystrokes and time. One disadvantage, at least for those of us with extensive typing experience, is having to move our hands away from the keyboard to reach for the mouse. (Many applications provide keyboard options to replace some mouse/menu actions, however.)

Pull-down menus have three distinct advantages: they are available instantly, they're hidden when not needed, and their commands are in plain English. After using five different Macintosh applications, I've come to realize that "plain English," although infinitely better than complicated commands, does not mean you'll always understand exactly what the commands mean without further study. For example, the Save command on a Macintosh is equivalent to Save and Replace on some other systems. You'll need to learn what commands such as Iterate or Properties really do, but once you know, you're unlikely to forget what a specific command does.

**Microsoft Multiplan**

When you start the Multiplan program, the screen comes up in the usual spreadsheet grid format, with 14 rows and 6 columns on the screen. Because of the relatively small size of the screen, the Macintosh doesn't provide as much workspace as what you see at once on some other computers. At the top of the screen is a menu bar; below that is a formula area. Creating a spreadsheet involves several operations: entering text and data, creating formulas to perform calculations, and formatting.

Entering information into cells is where the mouse really comes in handy. You have many ways to select items on the screen. Pointing at a cell and clicking on it selects that cell. You can click on a row or column header and select an entire row or column, or you can select a range of cells by holding down the mouse button and dragging the mouse across them. Then when you press the Enter key, the next cell of the range you've se-

lected becomes active. This method of selecting groups of cells helps you avoid constantly reaching for the mouse. If you're an inveterate spreadsheet user from premouse days, you may want to use certain keystrokes that let you move the pointer from cell to cell in a manner similar to arrow keys.

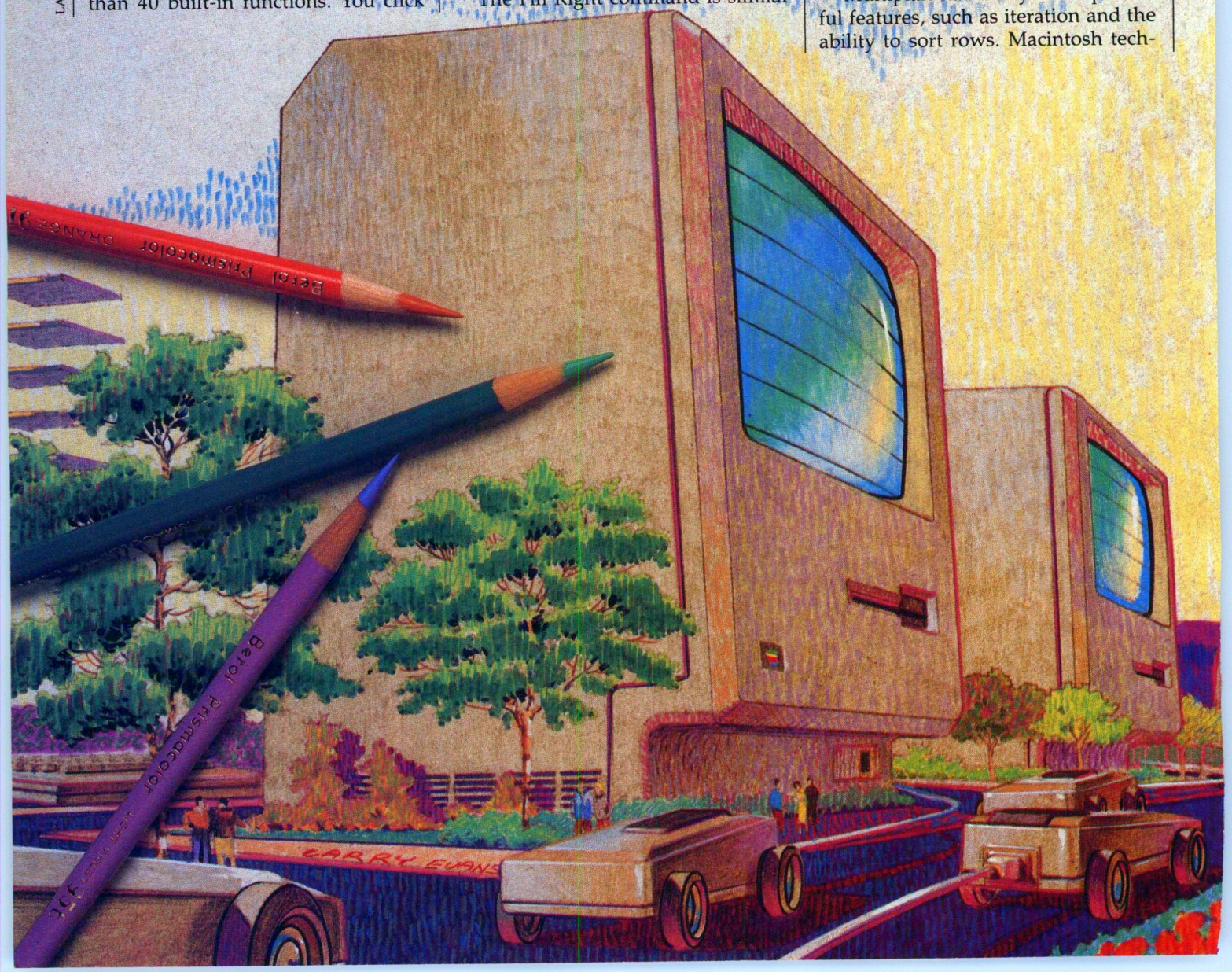
Once you've selected the cell (or cells) you want, entering text and values is simply a matter of typing the information on the keyboard or optional numeric keypad. When you build formulas, you'll see the real beauty of the combination of the Macintosh and Multiplan. Formulas begin with an equal sign. If you want to add together the contents of two cells, you type =, then click on the first cell, type +, click on the second cell, and press. To add a range of cells, you can use the Paste function. Open the Edit menu, choose the Paste function, and you'll see a dialogue box that includes a list of more than 40 built-in functions. You click on the one you want (Sum, in this case). Then you drag the mouse across the cells you want to add up and press the Enter key.

One of the features I like best about Multiplan is its ability to name cells. Imagine a simple budget with line items down the rows and months across the columns. You can select all the cells under January, choose Define Name from a menu, and actually name these cells January. Now if you want to sum those cells you can first paste in the Sum function, then paste in the name January, and you'll have the sum of January's budget items. This is particularly nice when you use the Show Formulas command to see formulas; you see at a glance that you've added January sales, rather than seeing cryptic cell references. And, if you're working with a large worksheet and want to check which cells are named January, you can open a menu and ask to have them selected.

The Fill Right command is similar to a replicate command on other programs, and lets you copy a formula across a number of cells. Copying groups of cells is as easy as selecting them and choosing Copy from the Edit menu and then pasting them to a new loctaion. Better yet, you can use the Copy command, load another spreadsheet, and copy the group of cells to the second spreadsheet. Alternatively, you can copy them into other Macintosh applications, such as the word processor. You may have to set up some tabs so the columns will line up properly, but pasting across applications is easy.

Multiplan is able to link spreadsheets, which is great for consolidating several tasks. The mouse simplifies formatting. Widen a column by dragging the column header to the right. Add a blank row by holding down the Shift key and clicking the mouse button. Use menu commands to align text to the left or right, or in the center.

Multiplan has many more powerful features, such as iteration and the ability to sort rows. Macintosh tech-




LARRY EVANS

nology makes it easy to move around the worksheet, get to where you want to, and set up formulas.

**Microsoft Chart**

Even number crunchers love pictures of their numbers, especially when trying to explain them to nonmathematicians. Chart translates numeric data into graphics that are especially impressive with the ImageWriter printer.

Because I haven't had a lot of experience with business graphics, I decided this would be a good chance to see how easy it was to *learn* this program (and also a chance to see how good Microsoft is at writing usable manuals). I worked through the tutorial in less than 25 minutes, and when I was finished I was not only comfortable with some new terms and concepts, but I also knew enough to enter my own data and turn it into an incredible variety of graphics. Chart offers seven different kinds of line charts and five kinds of area charts—more than 40 different styles in all. The learning process involves getting your numeric information into the system; once you do, you can produce any available chart at the click of the mouse button.

Before you begin, you should learn a few basic terms. Data is organized into series, each series contains sets of categories, and each category has a corresponding value. When you start the Microsoft Chart program, you get two windows on the screen, one for drawing the graph and a New Series window for entering your data. You can enter numbers directly or paste them in from a Multiplan worksheet or from a word-processing program. After entering the values, you can immediately plot them into a bar graph by selecting Plot Series.

Adding labels for axes, titles, and legends appears, at first glance, to be a complicated process. I intuitively expected to select an area and type the information in, but this is not the case. You select a menu item and type the information into a dialogue box.

At this point in the process, you already have a visual representation of the values on the screen. Suppose you are graphing sales over time. You don't have to type 1984, 1985, 1986, etc. You open the Data menu and choose Date, indicating that this data changes by increments of time. When the dialogue box comes up, you enter the name of your series and the labels of the axes. Then you indicate that your data is in years, and that each category should be increased by one year. The program does the rest. You can use a similar process for different kinds of data categories (sequential, numeric, or text for typing in labels).

Once you've entered the information about the series, the fun begins. By choosing from the Gallery menu, you can create area, bar, column, line, pie, or scatter charts (with a variety of different patterns for each) almost instantly. Since I had prerelease software, I didn't time the program, but it was incredibly fast, and the charts were absolutely beautiful. Printing them was a matter of choosing Print from the File menu.

With Microsoft Chart you can overlay charts, plot projections and trends, and even establish links to Multiplan worksheets, so that when your numbers change, your charts will change as well. These techniques may take a bit more time to learn, but I did have the basics down in half an hour.

**Microsoft Word**

There's a rumor going around about the Macintosh that you can only have 10 to 20 pages of text in memory at one time. This lack of space is a limitation of MacWrite. For those of us who think we're about to write the great American novel, this restriction could present problems. Thus, I was anxious to find out if Microsoft Word allowed longer documents. The answer is yes, yes, yes! Word uses what is called a disk-resident storage system, which means that it writes portions of a document to disk when necessary. In this case, the length of your document is limited only by the amount of space available on your diskette.

That's just the beginning of the good news. Imagine a program that, in addition to offering the traditional editing functions of a word processor, lets you cut and paste across four different windows, keys long phrases into a glossary so you can retrieve them with simple abbreviations, shows nine different type fonts and six type styles on the screen, lets you merge copy into form letters, and manages your footnotes, even to the point of automatically renumbering them when you add or delete one. The phrase "next generation" is usually applied to spreadsheets, but Microsoft Word is truly a next-generation word-processing program.

*The phrase 'next generation' is usually applied to spreadsheets, but Microsoft Word is truly a next-generation word-processing program.*

Here's where the point-and-click approach really shows its stuff. Using the mouse, you select some text. Then you face a myriad of choices. You can delete; copy; move; copy to the glossary; paste to another document; and see it in boldface, italics, underlined, subscript or superscripts, shadowed, or outlined. Performing any of these operations requires simply opening a menu and choosing the command. If you change your mind, you can always choose Undo to undo your last command.

Formatting is equally easy. To set margins, you drag markers to where you want them on a ruler. To set tabs you choose Tabs, and when the dialogue box appears, you select the kind you want (left, center, right, or decimal). Then you click on the ruler at the points where you want the tabs. Selecting and choosing becomes automatic so quickly that you can forget what kind of shenanigans you had to go through to accomplish these tasks on other computers.

In order to further explore Microsoft Word, I tried out one of its fancy functions: creating footnotes. I set an insertion point by clicking the mouse button at the point in the text where I wanted the footnote indicator to be. Then I opened the Document menu and chose Footnote. The dialogue box asked me if I wanted the footnote numbered automatically or if I wanted to type in some text instead as my own indicator. I typed in an asterisk and clicked OK. After the dialogue box disappeared, the screen split into two sections. I saw my asterisk in the body of the text. In the lower window was another asterisk with the insertion point set waiting for me to type the footnote. I typed it in, and that's all there was to it.

I then chose Print from the File menu, answered some questions about printing, and waited. I had purposely chosen a document that was longer than one page. And there came my document, with the footnote at the bottom of the text broken at the appropriate place.

I also tried out the automatic numbering system, entered two footnotes and then entered a third between the first two. Watching the automatic renumbering before my eyes reminded me what it was like to type footnotes on a typewriter. I haven't done footnotes on another computer, so I can't compare how difficult it may be, but I can imagine numerous commands and keystrokes that may be necessary.

**Microsoft and the Macintosh**

Looking at highlights of these three programs should give you an idea of how they work on a Macintosh. The software is powerful, and the Macintosh simplifies its use considerably. Learning the programs has become easier than ever before. One of the best things about the Macintosh/Microsoft combination is similarity across programs. Once you know one, you have quite a bit of information about the next one.

If you've never used a computer, you won't realize how easy it is to use straightforward commands in pull-down menus. If you're familiar with other systems, though, you'll see that menus and dialogue boxes eliminate a lot of work and learning. +

## PRODUCT INFORMATION

**Microsoft Multiplan**
**Microsoft Chart**
**Microsoft Word**
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**List Price:** Multiplan, $195; Chart, $125; Word, $195

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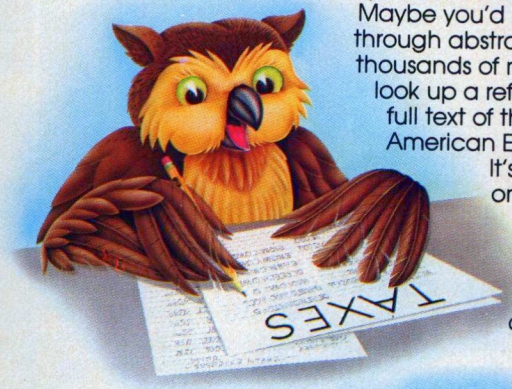


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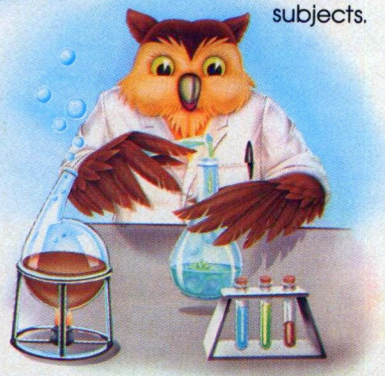

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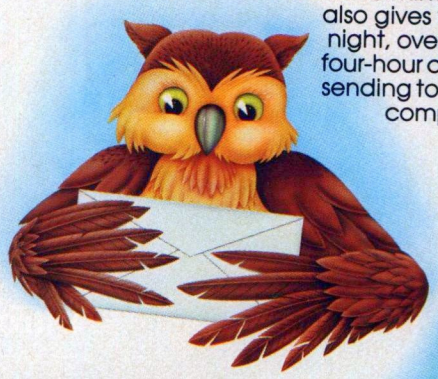

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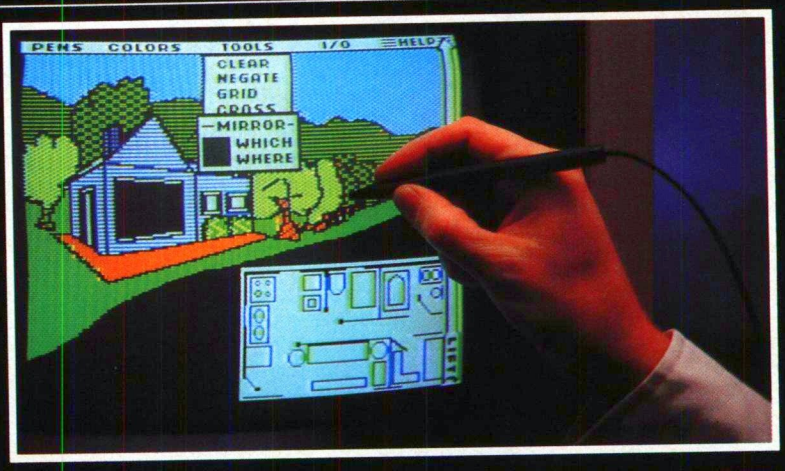


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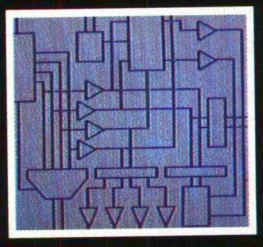


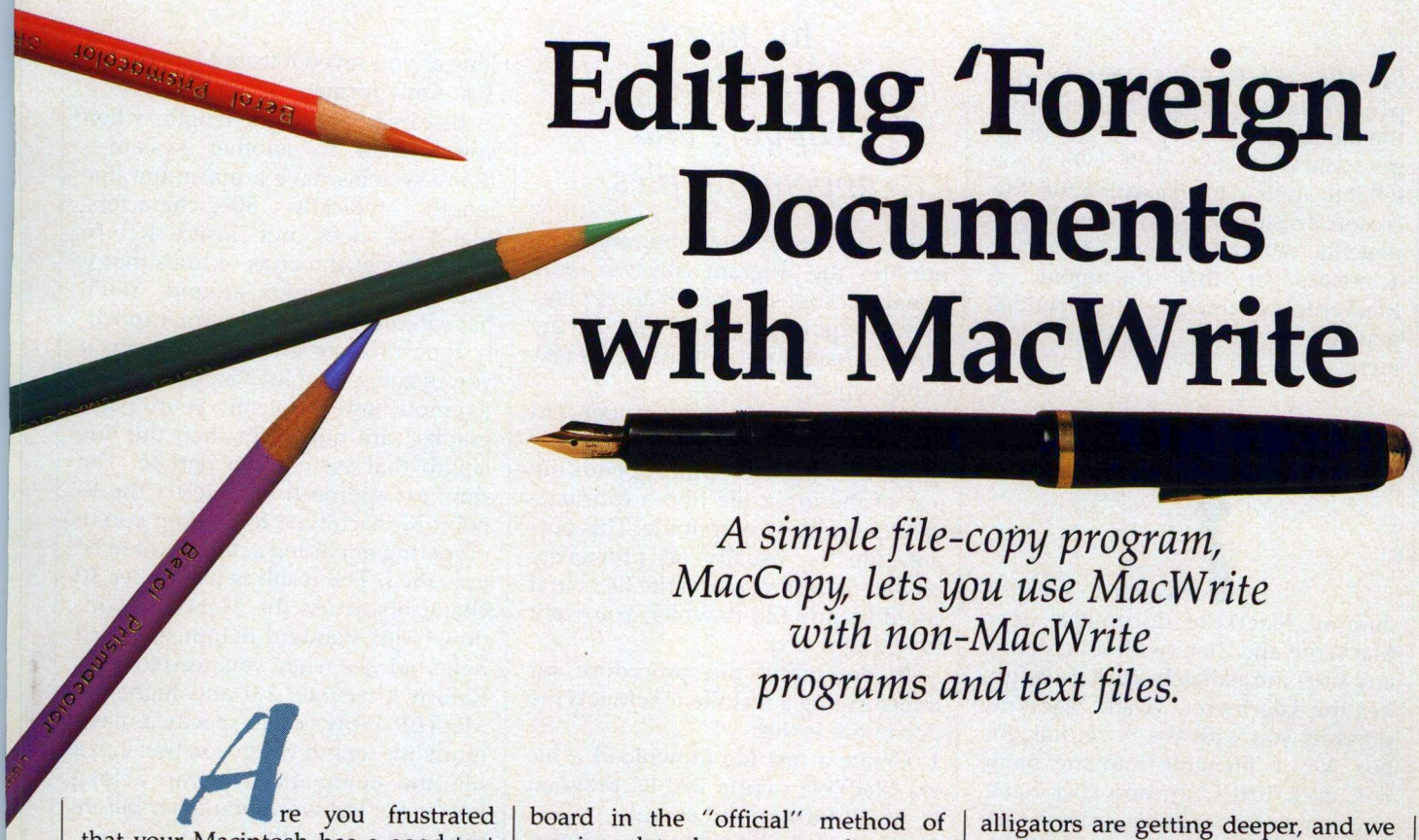
Koala Technologies
800-KOA-BEAR

# The Gibson Light Pen System

Touch the Magic of Light

CIRCLE 301 ON READER SERVICE CARD

# Editing 'Foreign' Documents with MacWrite



*A simple file-copy program, MacCopy, lets you use MacWrite with non-MacWrite programs and text files.*

Are you frustrated that your Macintosh has a good text editor, MacWrite, but that you can't use it on anything but MacWrite documents? Would you like to use MacWrite to edit your BASIC programs or files you've downloaded from another system with a terminal program? In this month's Under the Desktop column, I'll take a look at ways to use MacWrite to edit documents that weren't originally created by MacWrite. In the process, I'll present a simple file-copy program with several uses.

**Selective Vision**

Anyone who has much experience with Macintosh has probably noticed that most applications are specific about the type of document they will work with—MacPaint "sees" only MacPaint documents. MacWrite "sees" only MacWrite documents, and so on. So how do you use MacWrite to edit a Microsoft BASIC program or a text file you've downloaded with a communications program such as MacTerminal or the MacTEP terminal-emulation program? So far, I've found two methods that work: bringing text into MacWrite via the clipboard and appending text to an existing MacWrite document.

First let's examine use of the clipboard in the "official" method of passing data between applications. You can tell Microsoft BASIC to

```
SAVE "CLIP:",A
```

or

```
LIST line-range,"CLIP:"
```

thus copying all or part of a BASIC program (in ASCII format) into the clipboard. (Microsoft says that future versions of its BASIC may not have the SAVE "CLIP:" capability, but the LIST form should still work.)

Similarly, when you download text with MacTEP, you can reply to the Receive file: prompt with CLIP, and text received from the remote system will transfer to the clipboard. After either of these operations, you can invoke MacWrite, "paste" the clipboard into the text buffer, do any necessary editing, and save or print the result.

Examination of the pasted text may reveal a problem, however. The interface between Microsoft BASIC and the clipboard apparently has a bug (or maybe it's a "feature") that causes any commas that aren't surrounded by quotation marks to be translated as tabs. The solution is simple—you just select Change from the Search menu and change tabs to commas. This procedure leads to a further problem, though—you can't key a tab into the Find What box. The alligators are getting deeper, and we still haven't drained the swamp! The solution here is less obvious: With the mouse, select a tab in the text and copy it to the clipboard; then invoke Change again and paste the tab into the Find What box. You can then key a comma into the Change To box and click the appropriate function (Change All if the text has no intentional tabs, Find Next otherwise).

Once you've cleaned up and have done any necessary editing,you can copy it back to the clipboard. From the clipboard, you can then load or merge it into Microsoft BASIC or upload it to another system via MacTEP, by referencing the device CLIP:. In all of these cases, because of the aforementioned "feature," any tabs not surrounded by quotation marks in the text will be translated as commas.

**Helpful Dummy**

The second method for applying MacWrite to non-MacWrite text files is actually to create a MacWrite document from a text file. To do so, you

use Microsoft BASIC's Open for Append feature to append the text from the file to a previously created "dummy" MacWrite document. When you tell it to append to an existing file, Microsoft BASIC adds text to the end of that file, without changing the characteristics of that document. A MacWrite document with appended material remains a MacWrite document.

In order to create a dummy MacWrite document, open MacWrite and then (without entering any text) immediately click Save under the File menu. When MacWrite presents you with the Save dialogue box, key a filename into the name box, click Text Only, and click Save. You can go through this process each time you need a dummy MacWrite file, or you can do it once to create a master file (I call mine MacWrite Dummy) and then create duplicates of this master file when you need them, the same way you duplicate the Empty Folder as needed.

Now that you have your dummy MacWrite document, what do you do with it? A quick-and-dirty way of using it, when the text file you want to turn into a MacWrite document is being produced by a Microsoft BASIC program (such as MacTEP), is to modify the program. Change the appropriate OPEN filename FOR OUTPUT statement to OPEN filename FOR APPEND, where filename is the name of a MacWrite dummy document you've prepared as in the description above.

A cleaner method, and one that you can use with all text files (not just files created by Microsoft BASIC programs), is to use the file-copying utility program MacCopy (see page 131). This program, written in Microsoft BASIC, copies one user-designated file or document to another, character by character. You can specify the input or output file (or both) as one of the device names that Microsoft BASIC recognizes (e.g., CLIP: or LPT1:).

*The MacCopy program is useful for more than just copying and appending files.*

After you specify the input and output files, the program asks two additional questions: whether to append to the output file, and whether to insert line feeds after returns in the text being copied.

If you answer Y to the Append to Output File? question, MacCopy opens the output file and appends the text of the input file into a (presumably) preexisting output file. This output file is usually a previously prepared dummy MacWrite file, but it could be any file to which you want to add new text.

In summary, the procedure for transforming a text file to a MacWrite document is this:

1. Create a text file (download a file via MacTEP, save a BASIC program in ASCII format, and so on).
2. Create a dummy MacWrite document by saving a blank MacWrite document.
3. Open MacCopy (or open MS-BASIC, then open MacCopy, and run).
4. When MacCopy asks for the Input file, key in the name of the text file to be converted, followed by Return.
5. When MacCopy asks for the Output file, key in the name of the new MacWrite dummy, followed by Return.
6. When MacCopy asks whether to append input to output, key Y, followed by Return.
7. When MacCopy asks whether to insert line feeds after returns, key N, followed by Return.
8. MacCopy will append the input to the output—have patience, though; it's not a speedy process.
9. When MacCopy finishes the operation, it will ask for a new input file. Just press Return to exit from MacCopy back to the Finder.
10. Back in the Finder, you can open the new MacWrite document and do whatever you want to it.

You can load or merge a MacWrite document (either from scratch or created and edited as just described) into Microsoft BASIC or upload it to a remote system by using MacTEP, as long as you saved it from MacWrite in Text-Only format.

Be careful about line lengths when you upload to another system—many systems have a maximum line length, typically 80 characters. MacWrite does not insert Return characters at the ends of lines that it automatically wraps around. You'll have Returns only where you explicitly type them to end a paragraph. If you're going to upload a document to a remote system, be sure your "paragraphs" are no longer than the line length that system can handle. The simplest approach is to select the 9-point Monaco type font when you're preparing or editing a document to be uploaded. The result is just under 80 characters across the MacWrite window (with standard margins), which helps you see when you need to press Return. (Versions 2.0 and higher of MacTEP allow you to specify a maximum line length when you transmit a file and automatically wrap a long line at the last word boundary before the specified length.

**Other Functions**

The MacCopy program is useful for more than just copying and appending files. For instance, you can use it to print non-MacWrite text files on the Imagewriter printer, which you do by copying to LPT1:, and it is the major reason for the "Insert Linefeeds . . . " question.

Most text files on the Macintosh (including those downloaded by MacTEP) terminate each line of text with a single Return character, without a following line feed. If you simply copy a file of this type to LPT1:, the entire file will overprint on a single line—the Imagewriter does not automatically issue a line feed when it receives a Return. To avoid this problem, MacCopy inserts a linefeed character after each Return it sees while copying if you tell it to do so, which results in properly formatted output on the Imagewriter.

In summary, to print a text file:

1. Open MacCopy (or open MS-BA-

# MacCopy

*This program, written in Microsoft BASIC, copies one user-designated file or document to another, character to character.*

```
1000 CLS:PRINT:PRINT:PRINT
1010 PRINT "MacCopy - V1.10 -";
1020 PRINT "Copyright (c) 1984,";
1030 PRINT "Brothers Associates"
1040 REM
1050 DEFINT A-Z
1060 CR$=CHR$(13) ' Return code
1070 LF$=CHR$(10) ' Line-feed code
1080 REM
2000 REM Get file specs,options.
2010 PRINT:PRINT
2020 PRINT "Input File or Device";
2030 PRINT "(Return to Quit):";
2040 LINE INPUT INF$
2050 IF INF$="" THEN SYSTEM
2060 OPEN INF$ FOR INPUT AS #1
2070 PRINT "Output File or Device";
2080 PRINT "(Return to Start Over):";
2090 LINE INPUT OUTF$
2100 IF OUTF$="" THEN 2000
2110 PRINT "Append to Output File?";
2120 PRINT "(Y/N,Return=N):";
2130 LINE INPUT R$
2140 IF R$="Y" OR R$="y" THEN 2170
2150 OPEN OUTF$ FOR OUTPUT AS #2
2160 GOTO 2180
2170 OPEN OUTF$ FOR APPEND AS #2
2180 PRINT "Insert Linefeeds after";
2190 PRINT "Returns? (Y/N, Return";
2200 LINE INPUT "=N): ",R$
2210 IF R$="Y" OR R$="y" THEN 4000
2220 REM
3000 REM Straight copy or append
3010 WHILE NOT EOF(1)
3020 PRINT #2,INPUT$(1,1);
3030 WEND
3040 GOTO 5000
3050 REM
4000 REM Copy with LF insertion
4010 WHILE NOT EOF(1)
4020 C$=INPUT$(1,1):PRINT #2,C$;
4030 IF C$=CR$ THEN PRINT #2,LF$;
4040 WEND
4050 REM
5000 REM Close files and restart
5010 CLOSE #1
5020 CLOSE #2
5030 PRINT
5040 PRINT "Operation Completed."
5050 GOTO 2000
5060 END
```

SIC, then open MacCopy, and run).
2. When MacCopy asks for the Input File, key in the name of the text file to be printed, followed by Return.
3. When MacCopy asks for the Output File, key in LPT1: followed by Return.
4. When MacCopy asks whether to append input to output, type N, followed by Return.
5. When MacCopy asks whether to insert line feeds after Returns, key Y, followed by Return.
6. MacCopy will print the text file on the Imagewriter.
7. When MacCopy finishes the operation, it will ask for a new input file. Just press Return to exit from MacCopy back to the Finder.

That does it for the technical stuff for this month.

This is a new column, a look "under the desktop" of the Macintosh and its software. In it I will present a series of useful techniques that anyone can use to get more out of the Macintosh—it will not be a tutorial on Macintosh internals, aimed at hard-core hackers, however. I'll also try to report on the inevitable bugs and "gotchas" that we can expect in any new computer system.

Most of the topics in the column will probably use one of the programming languages available for the Macintosh, either for illustration or for the construction of short utility programs such as MacCopy. This month's emphasis on Microsoft BASIC is because it was the first programming language available for the Macintosh. In future columns I hope to use other languages, as they become available.

If you've come across a particularly clever or unusual way of doing something useful with the Macintosh or have comments about anything appearing in the column, drop me a note, either care of *A+* (11 Davis Drive, Belmont, CA 94002), or via CompuServe (ID 70065,172) or MCI Mail (ID BROTHERS). +

*Your Basic BASIC and More*

# Microsoft BASIC

If you've used BASIC on other machines and have tried out any Macintosh program, you won't have any problems writing Microsoft BASIC programs on the Macintosh right away. If you've never done any programming at all, and BASIC is the first program you try on the Macintosh, you may initially find program development a bit confusing. If you persevere for an extra five minutes, though, you should have no further trouble.

Microsoft BASIC is as close to a universal language as any you can find in the personal-computer industry. It is available for every significant computer, either with the machine or for separate purchase.

The Macintosh MS-BASIC is an interpretive version of the language—you can run programs immediately after you write them without the need for an intermediary compilation stage. This version adds windows for program development and editing (but not during program execution), long strings, some added graphics commands, and support for the mouse cursor controller. Otherwise, it is the standard Microsoft language, and you can easily use it with programs written for other machines.

The current release is solely an interpreter (meaning that it translates the BASIC program from source code to machine-language form each time), but the general Microsoft practice is to provide corresponding compilers for its BASIC language products. Thus, for now, others who want to run a program you write with this BASIC must also have their own copy of the interpreter in order to run your code.

**Getting Started**

The Microsoft BASIC disk comes with the essential parts of the Macintosh system on the disk, so all you have to do is turn on your machine

and put in the disk. Be aware, however, that the disk is write-protected (with a square opening in the lower left corner), so you won't be able to store any programs on it. You'll therefore need to copy the contents to a blank disk or swap disks almost constantly during program development.

As with other Macintosh applications, you can pick an existing BASIC program, which automatically loads the BASIC language as well, or you can load the language itself and then call up a new or existing program. You'll find three sample programs plus an Advanced Notes icon—you run the latter to get the latest changes and helpful hints, and you can also use it as an example of how to program various text sizes and styles.

If you click on the MS-BASIC icon, you get the default screen: a bar of pull-down menus in the upper left, a title bar capping the output window, and down at the bottom a single-line command window (see figure 1). If you ask for a listing of part of the program, you also get a list box, normally set to overlap part of the right half of the output window. You can move the List window, but the Action and Command windows are fixed in place.

If you're entering a new program, you type it in on the keyboard. Each time you type, the Command window becomes active, and you get a standard Macintosh editing bar there as your cursor. Once you press Return and end the line, the line is also echoed up in the Action window so you can see what your previous lines have been. If your List window is active and your line falls within the range visible on the List window, the completed line will appear in the proper place in the displayed listing.

When you give the Run command (either by typing RUN and Return in the command box or choosing Run from the Control pull-down menu), the command line and any list boxes vanish, and the Action window takes over the screen. Any program output from Print or graphics-drawing commands shows up on the screen just as on a nonwindowing computer.

If you want to stop the program, you type Command-C (the Command is equivalent to the Control key on other computers and is the key next to the Option key with the curly H-like character on it), or you can use the mouse and click on Stop from the Control menu.

Whenever the program stops, the one-line Command window reappears at the bottom of the screen. As the manual points out, it is equivalent to the OK prompt in other versions of MS-BASIC or the ? prompt in Applesoft.

All these windows and boxes sound confusing and actually may be the first time you try this program. Once you get used to it, though, the fragmentation of the windows doesn't seem nearly as strange.

**Up and Running**

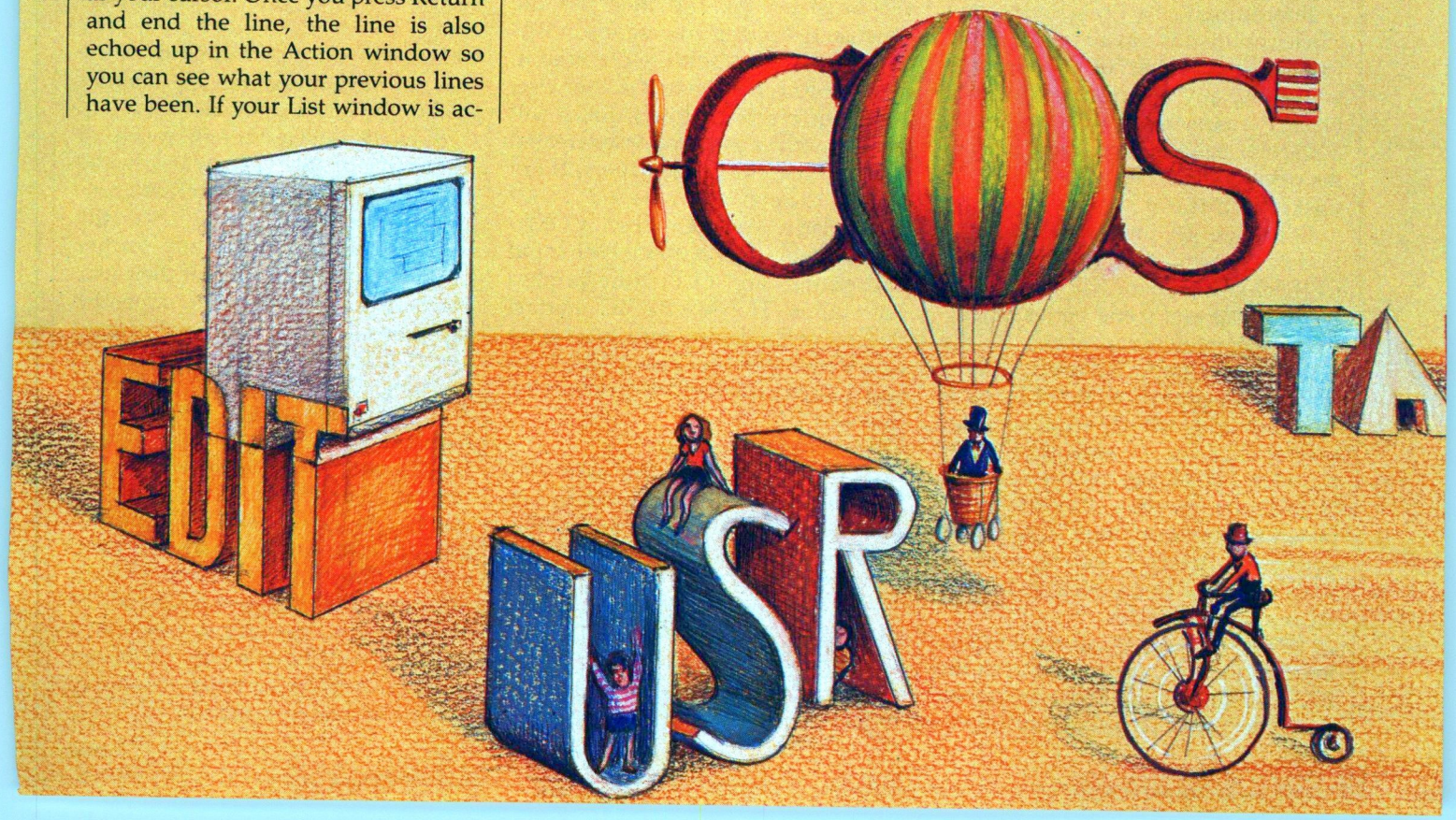
Once you've entered a program, you can run it, save it, edit it, or erase it, just as in any other standard version of MS-BASIC. If you're storing your program on another disk, you'll find yourself doing a lot of disk swapping at first. Apparently, BASIC pulls in only a minimum of the language from the disk into memory and needs to retrieve other sections of the language if you invoke various functions and commands.

If you attempt to run a program with a syntax error, the program will halt and give you a message box (see figure 2). If you click on OK or press Return, you'll be able to edit the offending line in the Command box. You can also move a line into the Command box for editing by using the Edit command or clicking on a line in a List box.

You do most of your editing by pointing with the mouse at the desired spot, clicking, and then using the Delete key or adding text. You can also select parts of lines or entire lines with the mouse and use the Cut and Paste choices on the pull-down Edit menu.

Even though it will leave you substantially less working room, you're probably better off copying the system and the MS-BASIC file to your work disk until you can get a second disk drive. Doing so will save you a considerable amount of time and lessen the disk-swap hassle as well.

DON DAY



**Graphics Commands**

The original version of BASIC and even the first Microsoft variation were both written before graphics were common on small computers. BASIC still has a more algebraic flavor to it than does a language such as Logo, but the Macintosh version lets you make use of this computer's graphics abilities.

One major addition to the standard Microsoft BASIC language is an extension of the Get and Put commands that lets you transfer images from the screen to arrays within BASIC. Thus, you can save and recall images and manipulate them in binary form without knowing anything about the actual physical addressing of bits on the screen.

Another new feature is the Mouse function, which reads one of seven values pertaining to the mouse position or button status. You can read the state of the button, the current x and y coordinates of the mouse-controlled pointer, where the pointer was at the time of the last button click, and so on.

If you want to work at the geometric level within BASIC, you have Line and Circle commands, as well as Pset and Preset for turning pixels on and off.

Interestingly, the Pset, Preset, and Circle commands can all have a value for color. A value of 30 signifies white, and any other value results in black. Perhaps this is an indication of a 32-color palette somewhere back in the development lab.

**Call to ROMs**

Once you get the BASIC graphics routines down, you'll probably want to check out Appendix E of the BASIC manual and some better Macintosh documentation, such as the QuickDraw graphics specifications for the Macintosh ROM. Microsoft has included calling sequences for several dozen of the Macintosh ROM routines, including many of the QuickDraw graphics functions. For instance, you can draw, fill, frame, erase, and invert. If you're working with text, you can switch text fonts, faces, modes, or sizes.

Unfortunately, you won't find any information on these functions in the BASIC manual. You'll have to consult the QuickDraw package documentation and probably do some experimenting.

*The original version of BASIC and even the first Microsoft variation were both written before graphics were common on small computers.*

**Files and I/O**

Microsoft has done a good job of extending BASIC judiciously, without adding too many specialized input/output commands. In most cases, this BASIC just treats new devices as special instances of files, screens, or keyboards.

One addition is that the program handles the system-clipboard file as a device for input and output. This approach allows you to read data from other programs and write data that other programs can read. Unfortunately, this method does seem to have several quirks (see Under the Desktop by Dennis Brothers, page 129).

Brothers' choice for getting text from BASIC to MacWrite is to create a file in MacWrite, and then use the Open and Append commands in BASIC. That way, MacWrite can read it, and BASIC can write to it. Otherwise, when you create a file in BASIC it will not be marked as a MacWrite-created file, and therefore MacWrite will not be able to open it.

Similarly, you can open COM1: (the modem serial port) for both input and output, and LPT1: (the printer) for output. The MS-BASIC manual doesn't give you any information on how to use those devices in BASIC, so you'll have to look elsewhere for vital details.

**Odds and Ends**

If you want to use the write-protected disk, you can save programs on another disk by prefacing the filename with a disk name and a colon, as in SAVE MYDISK:THIS FILE, and the Macintosh will prompt you through its usual disk-swapping routines.

You may want to take this approach, because you'll find that in addition to BASIC and the operating system, you won't have a lot of storage space on the disk. Neither, at least in this version, do you have a lot of RAM (you have fewer bytes free, unless you start removing various optional items from the RAM).

**Documentation**

Along with the single program disk, you get a nicely produced 215-page manual. The package molding has a place for an audiocassette tape, but none is supplied.

The manual starts with an introductory section, another on using the interpreter, and a third on learning the language. Most of the volume is a reference section that lists each BASIC command and function in alphabetical order, followed by various appendices and, finally, an index.

The manual is at its best in the reference section. Documentation writers have reworked and polished this material over the years for successive versions of Microsoft BASIC, and it is now clear and consistent. Unfortunately, the sections concerning BASIC on the Macintosh are not up to that standard.

For example, the introduction has you run one of the sample programs and then save it back on the disk. Since the system disk is write-protected, however, you can't save anything on it. I couldn't find any mention of write-protection or of the way to save programs on another disk in the entire manual.

Similarly, even though much of the power of this version lies in the ability to access Macintosh ROM routines, Appendix E merely lists the routines without giving any further information or examples of their use. For more information, the appendix says, consult the *QuickDraw Programmer's Guide*.

The graphic design of the manual is attractive. It's typeset, with good illustrations and plenty of examples in most sections. Obviously, the documentation people at Microsoft can do good work, given enough time. So now that the rush to market is over, perhaps they'll have time to go back and revise the Macintosh sections of the manual. Otherwise, if you're not a wizard, you'll have to rely on magazines and users' groups to supply some essential information.

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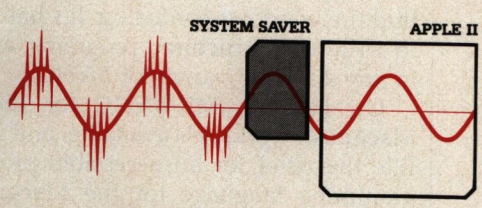


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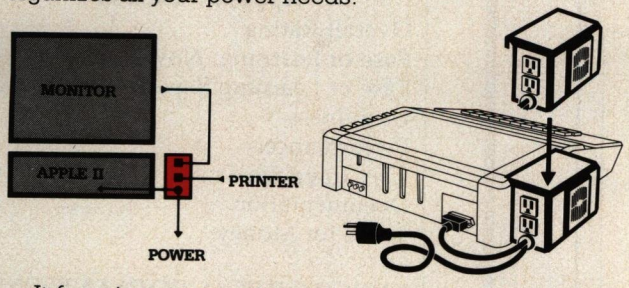


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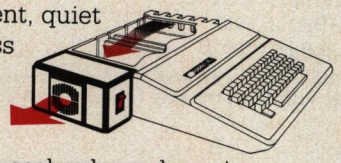

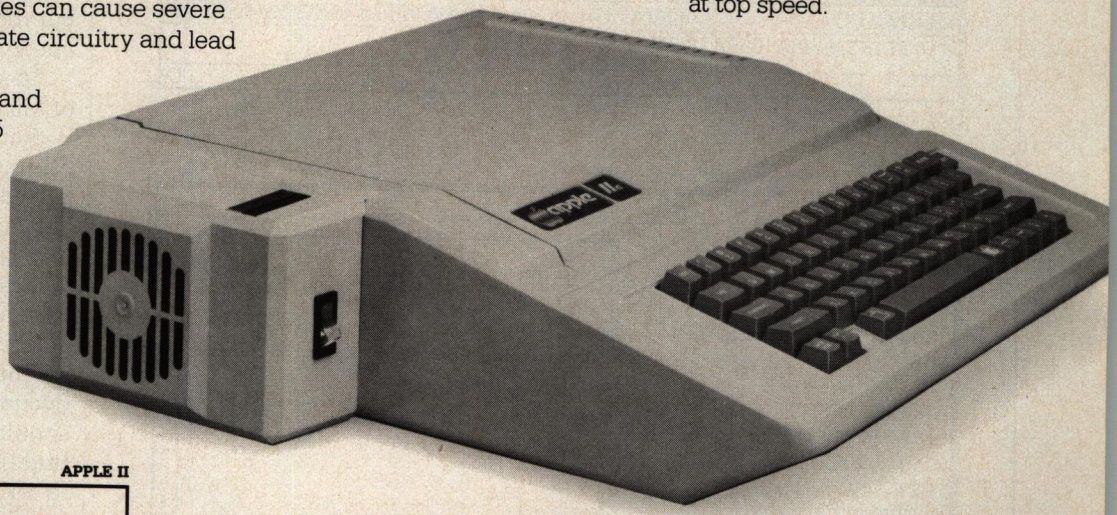

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*Softsel Computer Products Hot List. **PC Magazine: March 1983.

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CIRCLE 132 ON READER SERVICE CARD

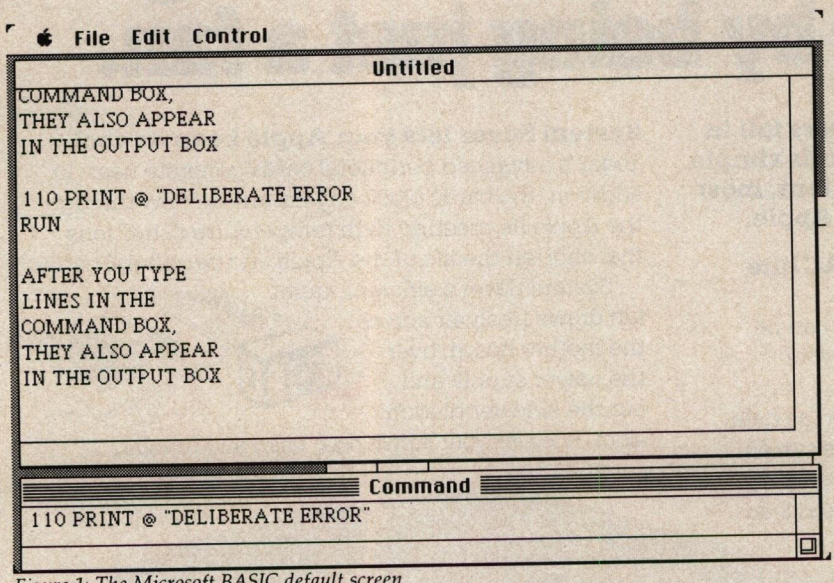


*Figure 1: The Microsoft BASIC default screen*

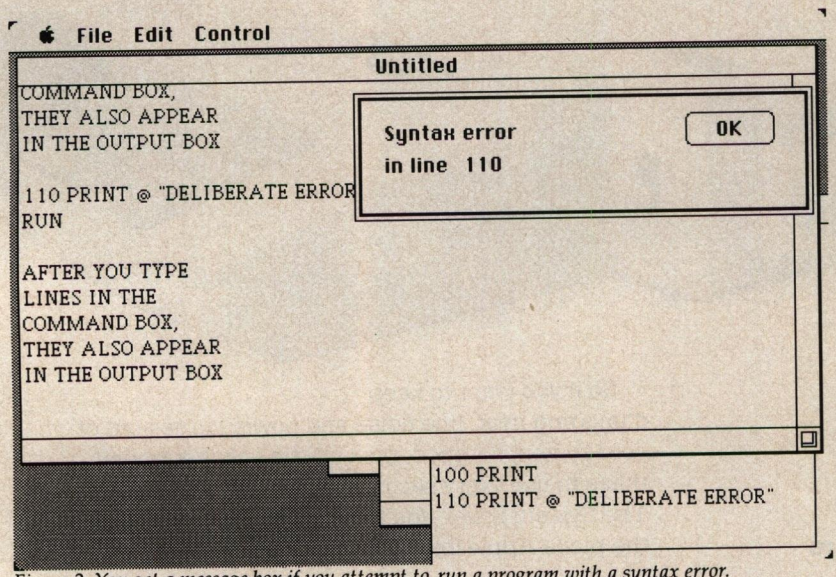


*Figure 2: You get a message box if you attempt to run a program with a syntax error.*

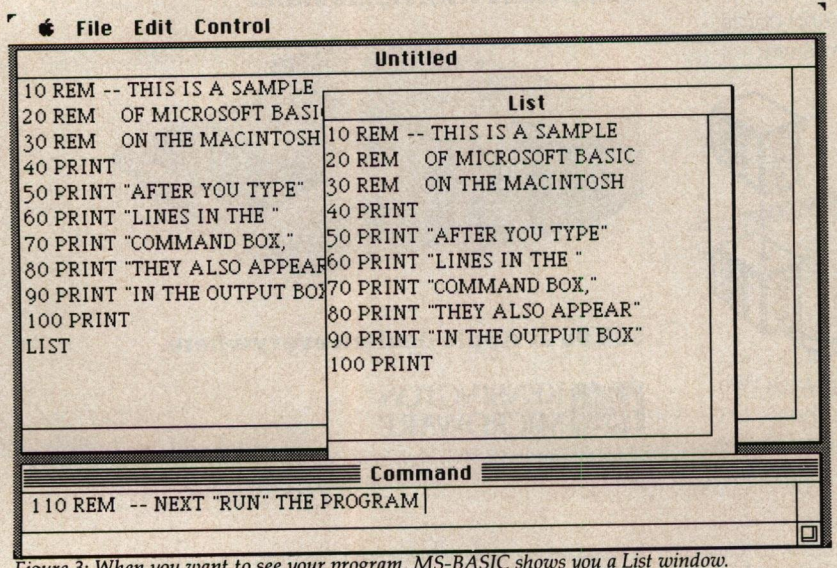


*Figure 3: When you want to see your program, MS-BASIC shows you a List window.*

**Overall Ratings**

Unless you're going to use your Macintosh purely with one commercial application program, the chances are overwhelming that sometime you'll need at least one short custom program. Although other languages may have theoretical and practical advantages for large projects, BASIC is most people's choice for quick, simple efforts.

Unlike the Apple II computers, the Macintosh has no built-in BASIC interpreter. Eventually, many different BASIC interpreters and compilers for the Macintosh will probably pop up, but the Microsoft product is the only one available as I write this review.

To summarize, the main advantage of Microsoft BASIC for the Macintosh is that it's a descendent of the most common, most tested, and most supported version of BASIC for personal computers. It lets you use the Macintosh's mouse and advanced graphics. You can call the Macintosh ROM routines without knowing machine language.

The disadvantages are that the documentation is not yet what it should be and that many users may find the windows confusing. It's hard to write well-structured programs, as in any standard variety of BASIC.

On balance, MS-BASIC for the Macintosh works, it's available, and it fills the need for an accessible programming language for the Macintosh. I've already used it for several programs and expect it to be one of my regular Macintosh tools. ✚

## A+ GRADE CARD

**Microsoft BASIC for Apple Macintosh**

| | |
|---|---|
| Overall Rating | A |
| Ease of Learning: Novice | B |
| Ease of Learning:Experienced User | A |
| Usefulness | A |
| Performance | A |
| User Interface | C |
| Documentation | C |
| Value for Money | A |

## PRODUCT INFORMATION

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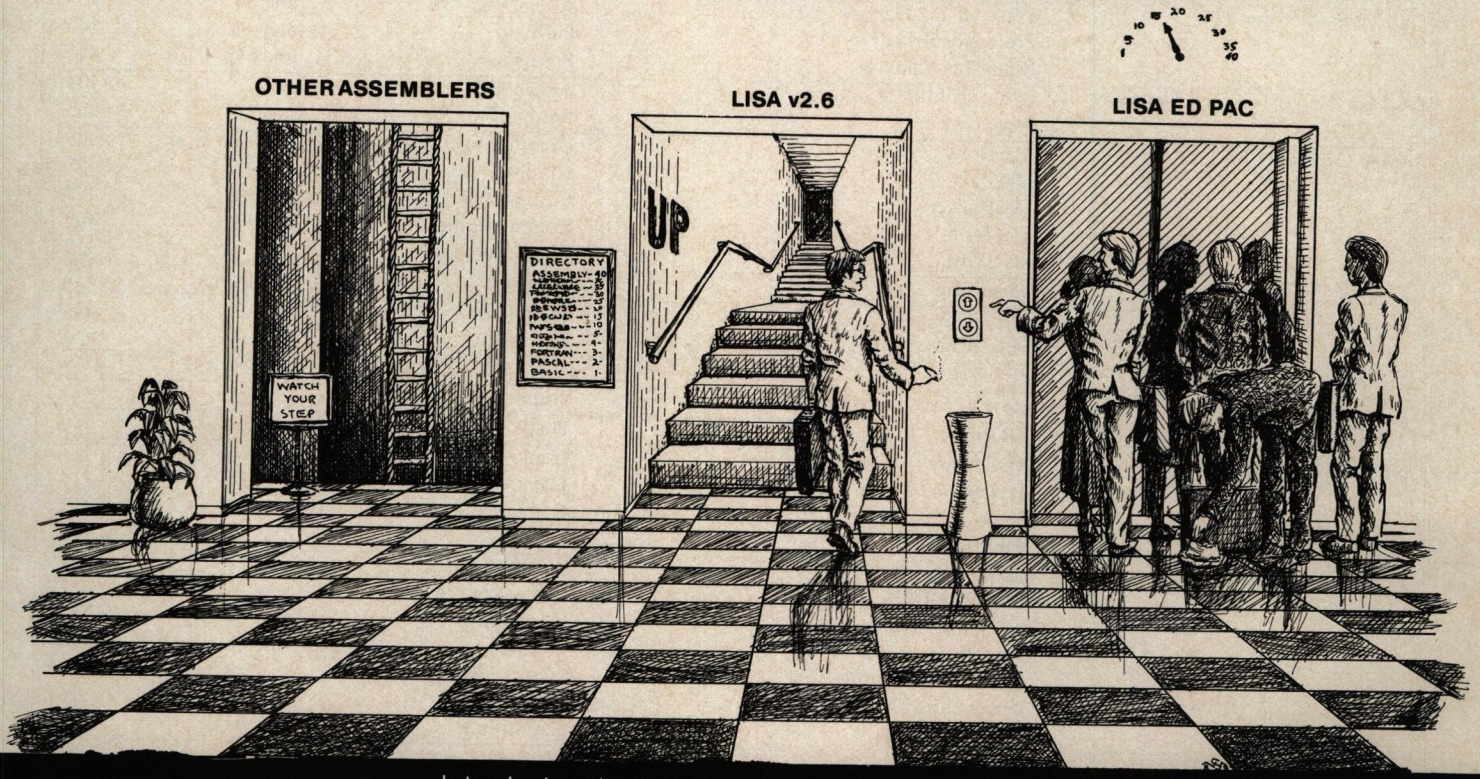


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CIRCLE 147 ON READER SERVICE CARD

BY CANDACE DE SANTIS

# New Software Products

Software companies are putting their programmers to work creating new versions of existing programs to take advantage of the Macintosh's unique abilities. This chart is the first of three we will be presenting in consecutive issues to keep you abreast of these new versions. For further information on any of these products, please circle the corresponding number on the Reader Service Card in this issue of *A+*.

| DEVELOPER | PRODUCT NAME | PRODUCT TYPE | AVAILABLE √ = *Now available.* | CARD# |
|---|---|---|---|---|
| Aardvark/McGraw-Hill | Personal Tax Planner | Accounting | June 84 | 401 |
| | Professional Tax Planner | Business | June 84 | 402 |
| | Estate Tax Planner | Business | June 84 | 403 |
| AgDisk/Harris Technical Systems | 28 Agricultural Products | Agricultural | √ | 404 |
| | Bank Disk | Business | June 84 | 405 |
| Apple Computer, Inc. | MacDraw | Graphics | √ | 406 |
| | MacPaint | Graphics | √ | 407 |
| | MacProject | Business | June 84 | 408 |
| | MacTerm | Communications | June 84 | 409 |
| | MacWrite | Word Processor | √ | 410 |
| Applied Software Technology | VersaForm | Database | Unknown | 411 |
| Artsci | MAGICphone | Telephone | √ | 412 |
| | MAGICfile | Database | √ | 413 |
| Ashton-Tate | dBASE II | Database | Summer 84 | 414 |
| ATI | How to Use Your Macintosh | Tutorial | √ | 415 |
| Aurora Systems | CRTplus | Financial | July 84 | 416 |
| Blue Chip Software | Millionaire | Game | √ | 417 |
| | Tycoon | Game | √ | 418 |
| | Squire | Game | √ | 419 |
| | Baron | Game | √ | 420 |
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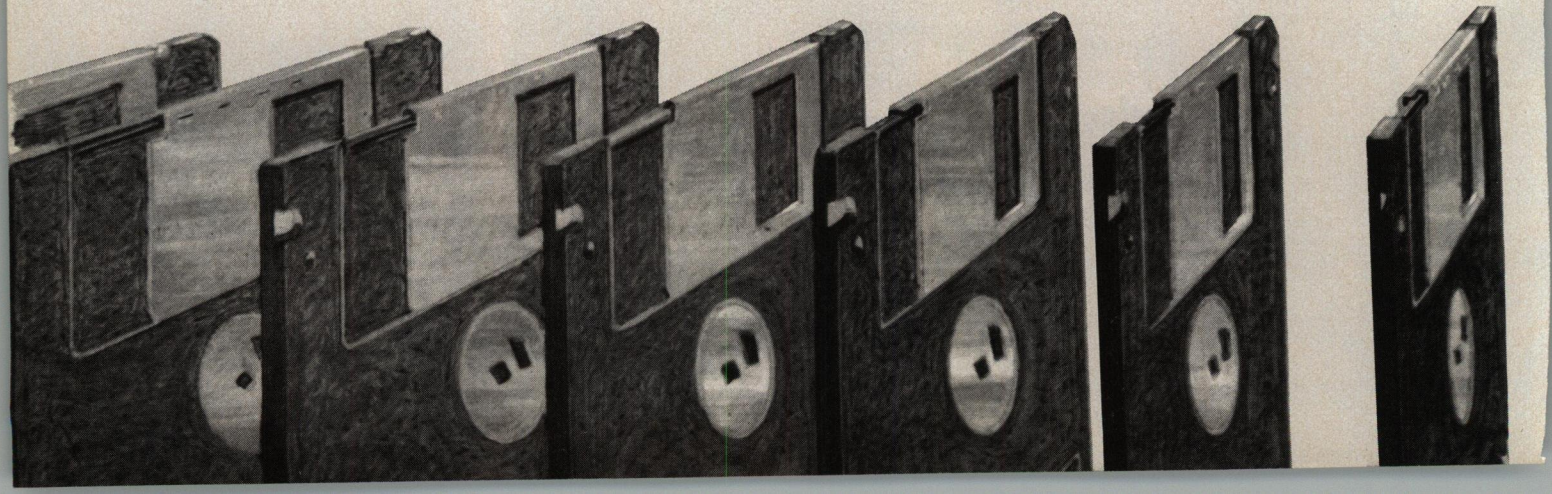
| | Accounts Receivable | Accounting | June 84 | 422 |
| | Accounts Payable | Accounting | June 84 | 423 |
| | Payroll | Accounting | June 84 | 424 |
| | Personal Accounting | Home Finance | June 84 | 425 |
| | Personal Investing | Home Finance | June 84 | 426 |
| | Speed Reading | Educational | June 84 | 427 |
| Brock Software Products, Inc. | Keystroke Data Base | Database | June 84 | 428 |
| | Keystroke Report Generator | Database | June 84 | 429 |
| CBS Software | Murder by the Dozen | Game | Unknown | 430 |
| Compu-Law, Inc. | The Client Management System | Business | July 84 | 431 |
| Continental Software | The Home Accountant | Business | July 84 | 432 |
| Creative Solutions, Inc. | MacForth | Language | √ | 433 |
| | Time Manager | Business | June 84 | 434 |
| | Office Planner | Business | June 84 | 435 |
| | Graphic Terminal Emulator | Utilities | June 84 | 436 |
| Davong Systems, Inc. | Disk Drive | Peripheral | June 84 | 437 |
| | MacTape | Hardware | Sept 84 | 438 |
| | Tape/Disk Drive | Peripheral | Sept 84 | 439 |
| | Networking | Hardware | Sept 84 | 440 |



| DEVELOPER | PRODUCT NAME | PRODUCT TYPE | AVAILABLE ✓ = *Now available.* | CARD# |
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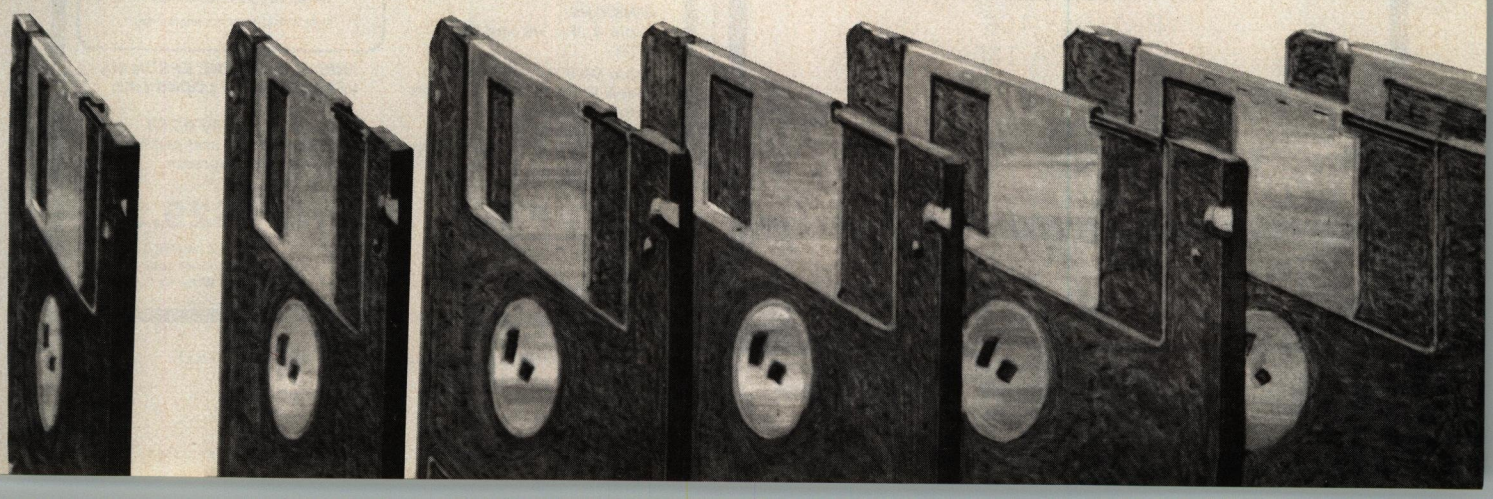
| Eagle Software Publishing, Inc. | Tax Decision | Business | June 84 | 442 |
| Haba Systems, Inc. | Habadex | Integrated | ✓ | 443 |
| Harvard Associates, Inc. | MacManager | Business | June 84 | 444 |
| Hayden Software Co. | Sargon III | Game | ✓ | 445 |
| | The Calendar | Business | ✓ | 446 |
| Human Edge Software Corp. | The Sales Edge | Business | June 84 | 447 |
| Infocom | Zork I, II, & III | Game | June 84 | 448 |
| | Infidel | Game | June 84 | 449 |
| | Deadline | Game | June 84 | 450 |
| | Starcross | Game | June 84 | 451 |
| | Witness | Game | June 84 | 452 |
| | Suspended | Game | June 84 | 453 |
| | Enchanter | Game | June 84 | 454 |
| | Planet Fall | Game | June 84 | 455 |
| | Sorcerer | Game | June 84 | 456 |
| Insoft, Inc. | GraForth | Graphics | July 84 | 457 |
| Kriya Systems, Inc. | Typing Tutor III | Educational | ✓ | 458 |
| Megahaus Corp. | Megawriter | Word Processor | June 84 | 459 |
| | Megaspeller | Spelling | July 84 | 460 |
| | Megafinder | Database | ✓ | 461 |
| MicroCom, Inc. | ERA 2 | Modem | July 84 | 462 |
| Microsoft Corp. | Multiplan | Business | ✓ | 463 |
| | Microsoft BASIC | Language | ✓ | 464 |
| | Microsoft Word | Word Processor | ✓ | 465 |
| Monogram/Tronix | Dollars and Sense | Financial | July 84 | 466 |
| Narv Enterprises | Factfinder | Word Driven Dbase | ✓ | 467 |
| Odesta | Helix | Database | ✓ | 468 |
| Penguin Software, Inc. | Transylvania | Game | ✓ | 469 |
| | The Graphic Magician | Graphics | ✓ | 470 |
| | The Quest | Game | ✓ | 471 |
| | The Coveted Mirror | Game | July 84 | 472 |
| Prometheus Products, Inc. | Intelligent Modem | Modem | ✓ | 473 |
| Psycomp | Coping with Stress | Psych. Self-help | July 84 | 474 |
| Roger Wagner Publishers | Typing Tutor | Educational | ✓ | 475 |
| | Programming Aid | Utilities | ✓ | 476 |
| Scarborough Systems, Inc. | Run for the Money | Game | June 84 | 477 |
| Software Arts | TK!Solver | Business | Unknown | 478 |
| Software Publishing Corp. | PFS:File | Database | July 84 | 479 |
| | PFS:Report | Database | July 84 | 480 |
| Sorcim Corp. | SuperCalc I, II, III | Spreadsheet | August 84 | 481 |
| Superex Home Software | The Home Executive | Integrated | ✓ | 482 |
| | The Retailer | Business | June 84 | 483 |
| | The Wholesaler | Business | June 84 | 484 |
| | The Superex Accounting Series | Accounting | June 84 | 485 |
| Tecmar, Inc. | Removable Cartridge Winchester | Peripheral | ✓ | 486 |
| | Telephone Modem Interface | Modem | ✓ | 487 |
| | IEEE 488 Interface | Hardware | ✓ | 488 |
| Think Technologies | Macintosh Pascal | Language | ✓ | 489 |
| Winterhalter, Inc. | Datatalker | Communications | ✓ | 490 |



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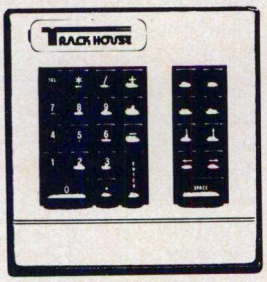


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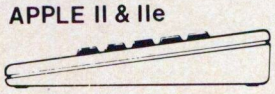

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*Weighing some criticisms of the Macintosh design*

# Not-So-Simple Hardware

Burrell Smith's hardware design for the Macintosh has received many criticisms in the press, most notably centering on the lack of expansion possibilities, limited memory, and lack of disk space.

Since I'm in the middle of writing a book that describes the inner workings of the Macintosh and how it makes the magic it does, I'd like to defend Smith's design and comment on several misconceptions that have been promulgated about the Mac.

**Thanks for the Memory?**

The first criticism everyone hears about the Macintosh involves its lack of random-access memory. To paraphrase a once-famous book title: 128K is not enough.

To dismiss the Mac's memory capacity without examining the issue more carefully is a disservice to the machine and its makers. First, that 128K of RAM is remarkably usable, especially considering that the video-display RAM is part of the 128K. The figure in column 2 shows the normal memory layout with a typical application running inside the computer. Note that the video display and sound buffers take up approximately 24K of RAM at the top of memory, and the Macintosh operating-system requirements use about 20K at the bottom of memory.

We're left with more than 80K of actual program space, a minor miracle compared to the working space of other machines (for instance, the Osborne executive, also a 128K machine, leaves only 60K for program space, even though video memory is outside the 128K main RAM area).

Although 80K of program space doesn't necessarily sound like a lot, it is in practice. Consider MacPaint, for example. This sophisticated program uses only 60K of RAM-stored instructions to do its magic; MacWrite takes up only 53K. The secret to these modest requirements is the Macintosh ROM. Within that 64K of ROM (actually only 32K 16-bit words of memory) are several hundred simple routines that programs can use. Both operating-system and drawing routines are stored in ROM, making the RAM-resident portion of a program mostly a structure from which ROM routines are called.

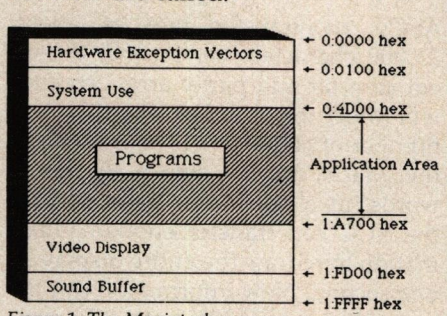



*Figure 1: The Macintosh memory map*

When I compare the RAM and ROM of a Macintosh with that of a 128K IBM Personal Computer, I find the Macintosh much more enticing for programmers. Compare the two:

| Macintosh | PC |
|---|---|
| 32K ROM contains op sys, QuickDraw | 40K ROM contains BIOS, BASIC |
| 128K RAM | 128K RAM |
| 20K op sys | 16K+ op sys |
| 24K graphics | |
| Program Space Available | |
| 80K | 106K |

These numbers are deceptive, however, since Mac's 68000 CPU addresses memory linearly and the PC's 8088 looks at chunks of 64K at a time. A close examination of most programs for a 128K PC shows that they actually use only 64K of program code. Addressing greater amounts of program code on the 8088 is, to me and many other programmers, a cumbersome task. Couple this observation with the fact that the IBM PC doesn't come close to offering the same prewritten routines in ROM and RAM, and you'll find me cherishing the Mac's 128K while installing 640K in my poor PC so that I can program my own drawing routines.

I am quite enthusiastic about programming with the Mac ROM. In a nutshell, here's how it works: Apple has set up all of the ROM routines as "trap vectors," using the 68000's exception-processing instruction. The TRAP operational code uses a table in low RAM memory to look up which routine to execute. Guess what? That table in low RAM points to the various ROM routines. Thus, all of the ROM routines function as extensions of the 68000 machine language and can be considered to have op codes assigned to them. It's as if Apple had a special version of the 68000 chip that recognized graphics and operating-systems commands at the op-code level.

For assembly-language programmers, the trap vectors make programming simple. High-level-language programmers will find that most languages on the Mac include predefined functions or procedures that perform each of the many ROM routines.

Which machine would I rather program with? The Macintosh, except for BASIC programming, in which the PC's ROM BASIC begins to save considerable RAM memory space.

A peripheral issue in the area of memory capacity is the old programmers' wisdom that programs increase in size to fill all available memory. What this means is that most programs are never refined enough; instead, inefficient code makes program structures meander around in memory like giant digital worms. True, memory chips are much less expensive than they used to be, but excess memory seems to encourage sloppy programming practices.

Now, don't get me wrong; there is a place for Macs with more memory. That's what the Lisa 2 line is about. Any extra memory inside a Mac would be used for data space rather than program space, though. With their current memory limitations, Macintoshes will never be efficient for editing large texts or spreadsheet documents, nor will they be effective in manipulating large databases.

Probably more controversial than the amount of memory Apple chose to put into the Mac is the fact that it is not internally expandable. The first thing any hardware hacker says upon examining the Mac is, "No slots?"

The Apple II has been successful mostly because it has eight built-in peripheral slots and users can "customize" their Apples in just about any way they want to. Apple IIs, for instance, were the most prevalent CP/M-based computer until Osborne and Kaypro came along to capture the low-cost CP/M user—even though you have to add another central processor to the Apple II before you can use CP/M! Because you can add anything you wanted in the II's eight slots, the Apple II is truly a *personal* computer.

Thus, to many, Apple's decision to make the Mac slotless was a surprise.

"How do I add to the machine?" knowledgeable users asked."Try the RS-422 ports," came the answer from Apple apostles.

That response kept everyone quiet for a few days while the more curious hackers proceeded to find out what

*Raw hardware speed is only one factor in the speed at which a machine appears to function.*

RS-422 meant. When they discovered that RS-422 is just a new standard for serial-communication channels, the uproar began anew.

"Hook a hard disk to that, and users will go back to floppies," some said. "Why no direct memory access (DMA)?" others cried.

Let's examine the RS-422 abilities of the Mac carefully and see if we can find out what the fuss is all about.

At the heart of the serial I/O in the Mac is a Zilog 8530 serial-communications controller (SCC). If left to its own devices (pun intended), the SCC can transfer information at rates up to 230.4K bits per second (baud) through either of its two channels. The channels are labeled with a picture of a printer (COM1:) and a telephone (COM2:) on the back of the Mac.

A rate of 230.4K translates into an ASCII text-transfer rate of about 23,000 characters per second; different stop-bit and parity arrangements will affect this number slightly. That number of characters is equivalent to the Mac's display screen. In other words, at a maximum transfer rate, the SCC can transfer enough information to redraw the entire display in one second. New information can replace the entire 128K bytes of memory with new information in less than six seconds.

But 230.4K bits per second is just the beginning with the Mac's SCC. If an external device is controlling the transfer and issuing a synchronous clocking signal that the SCC can latch onto, the transfer speed can increase to one megabit per second (1000K baud). This rate is approximately twice as fast as the speed at which the internal disk drive operates, so we can simply state that a properly designed hard-disk drive attached to the RS-422 port is capable of, at best, twice the speed of the Sony 3½-inch drive inside the Mac.

That's disappointing news, but not the death knell that IBM PCers seem to believe in. A hard disk on the IBM PC can directly access memory, if designed to do so. Therefore you'll find PCs with hard disks that perform several times better than any Mac disk currently can, yet raw hardware speed is only one factor in the speed at which a machine appears to function.

Since IBM's PC-DOS is not graphics-oriented, we have to look at other software to get a real comparison of the effective speed at which a hard disk can work on either the Mac or IBM PC. Visi On is currently the only software that comes close to what Mac's windowing looks like, yet Visi On running on an IBM PC XT (a hard-disk-equipped PC) appears to function no faster than the Mac works using just a floppy. What Mac sacrifices in raw hardware speed it makes up for in efficient operating-system and graphics routines.

In short, I do not believe that one-megabit-per-second hard-disk drives will prove to be slow or cumbersome on the Mac. Since a one-megabit transfer rate means that the entire contents of memory could theoretically be replaced in two to three seconds, I suspect that operating-system overhead will dictate exactly how fast you can load and save files on a Mac equipped with a hard disk.

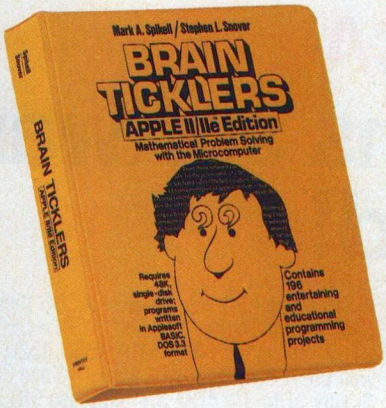
After studying the Mac's architecture carefully, I'm convinced that it shows the same engineering genius that the Apple II does. Apple will no doubt add more RAM to the current model, but I suspect that the rest of the design decisions will hold up for many years to come. Just as the Apple II design has shown "legs" in lasting seven years, the Mac design should endure, as well.

This article has dealt with the primary criticisms of the Mac design: memory and expansion capability. I haven't begun to describe the design methods of the display, sound, or ROM. Each of these areas is elegant enough to warrant a separate treatment, and we'll be looking at them more closely as this column begins to get more technical in nature.

If you're curious in the meantime, ask your local dealer to see the *Inside the Macintosh* documents Apple prepared for software developers. +

# Prentice-Hall speaks an Apple language other publishers have forgotten.

# English.*

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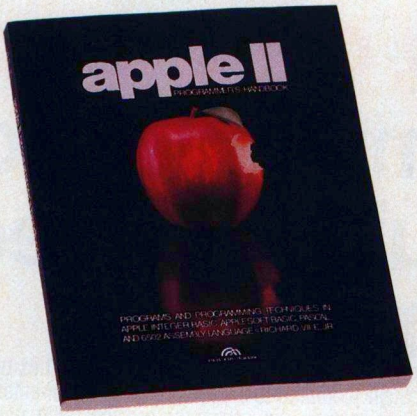


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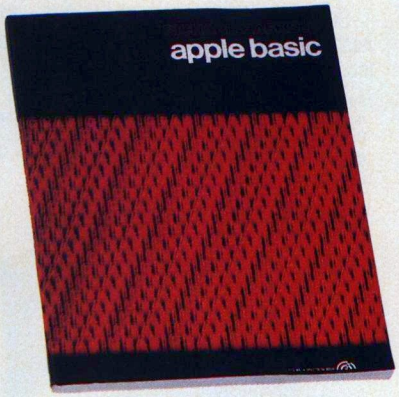


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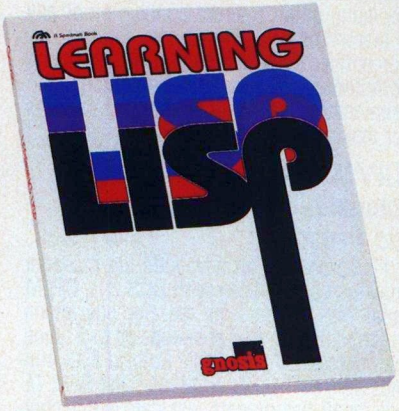


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Local file transfers allow DOS, CP/M, or Pascal files to be displayed, printed, or even copied to another disk. For example, a file on a CP/M formatted disk in Drive 1 could be copied to a Pascal formatted disk in Drive 2 providing a complete format conversion capability. Numerous editing options such as tab expansion and removing unwanted characters allow easy reformatting of data to accommodate the variations in data formats used by host computers.

### Multi-Protocol File Transfer Capability

Softerm 1 offers file transfer methods flexible enough to match any host computer requirement. These include the *character* protocol with user-definable characteristics to provide maximum flexibility for text file transfers to any computer. The CP/M User's Group standard *XMODEM* protocol may be used for binary file transfers with systems using the CP/M operating system. The intelligent *Softrans* protocol can be used to transfer *any* type file and provides automatic binary encoding and decoding, error detection and automatic retransmission, and data compression to enhance line utilization. A FORTRAN 77 source program is supplied with Softerm 1 which is easily adaptable to any host computer to allow communications with Softerm using the Softrans protocol. Specific host computer versions of the Softrans FORTRAN program are available on request.

Softerm file transfer utilizes an easy to use *command language* which may be executed interactively or from a *macro* command file which has been previously entered and saved on disk. Twenty-three high-level commands include *DIAL, CATALOG, SEND, RECEIVE, ONERR, MONITOR, HANGUP,* and others. A *SCHEDULE* command even allows file transfers at a specific date and time.

### Softerm 2
### The "Choice of Professionals"

Softerm 2 includes all features of Softerm 1 and provides an *exact* terminal emulation for a wide range of conversational and block mode CRT terminals. Special function keys, sophisticated editing features, even local printer capabilities of the terminals emulated are fully supported. In fact, your host computer won't know the difference! *All* of the following emulations are included in Softerm 2 and the list is growing...

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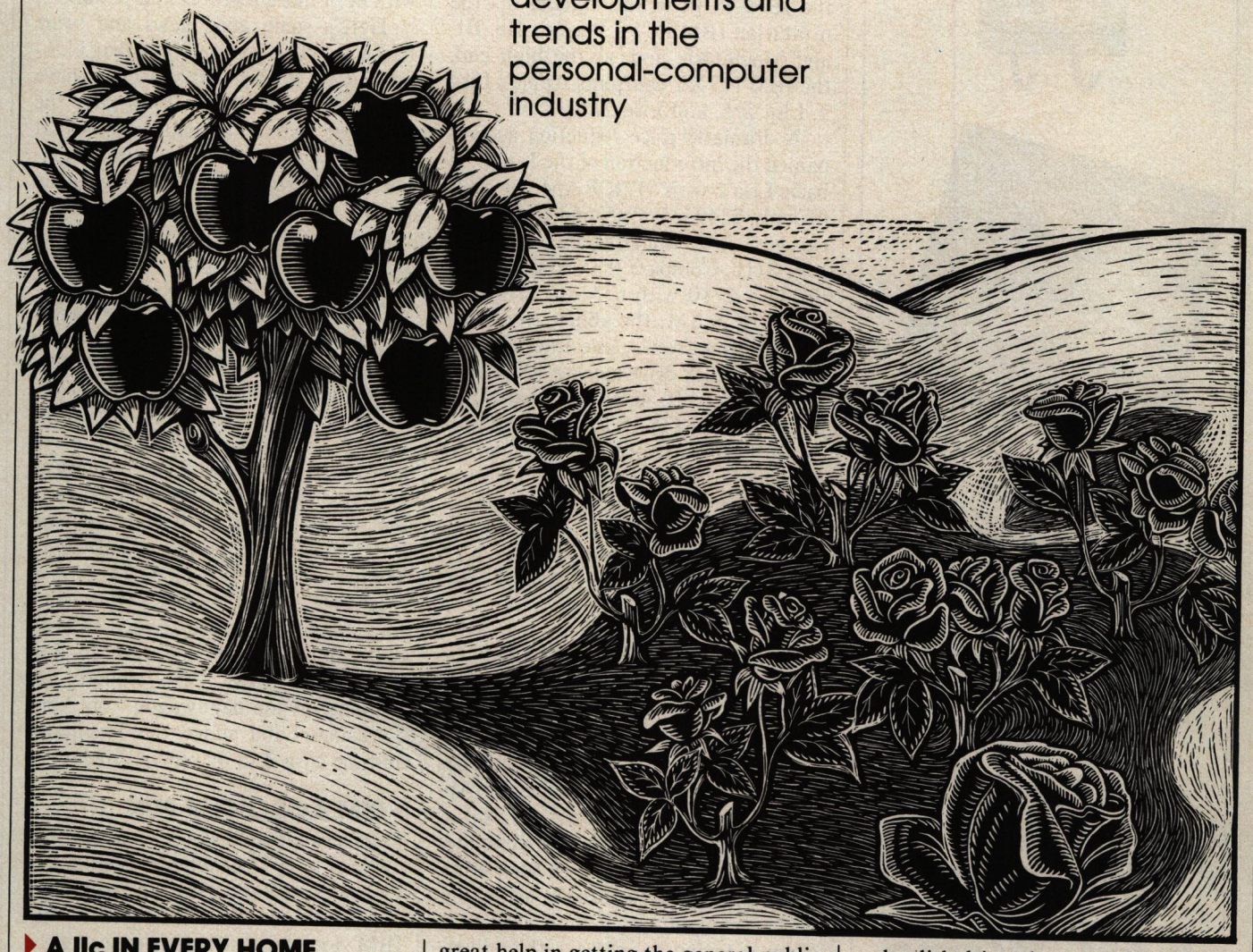
# NEWS+
**BY FREDERIC E. DAVIS**

Your inside source for developments and trends in the personal-computer industry



## A IIc IN EVERY HOME

The new Apple IIc is truly impressive—a real eye-popper with its sleek, clean-looking design. At last, a useful computer with the classy appearance of a high-tech home appliance has arrived. The 128K RAM, double-density hi-res graphics, built-in 5¼-inch floppy-disk drive, and numerous built-in expansion ports make this a powerful, ready-to-go portable. The IIc works with any TV set, the stylish Apple IIc monitor, other inexpensive video monitors, or the fantastic 80-character-by-25-line graphics LCD display that Apple will start selling this fall.

You can easily move the diminutive Apple IIc about the house. Unplugging it from its home on a desk is a snap; so is carrying it into the living room to play games in color on the TV set. Moreover, the fact that the IIc hooks up so easily to a TV set is going to be a great help in getting the general public to accept the computer as a household appliance. So far, Americans have welcomed into their homes only three items of electronic technology: the telephone, the radio/hi-fi, and the television. Virtually every household in America has these three appliances.

Because it is easy to hook the IIc up to a TV, you can bring this newest Apple into the house as an associate of the family television set. Apple is now selling modems, too, so the telephone can get into the act. The computer's acceptance as a household appliance is critical to Apple's success. I think the introduction of the IIc enhances Apple's prospects of attaining that goal.

## APPLE IIc TAKES ON PCjr

The introduction of the Apple IIc sends a loud-and-clear message to IBM: Watch out, PCjr! With 128K RAM and a disk drive, the Apple IIc sells for almost exactly the same price as the PCjr with 128K RAM and a disk drive. This situation could mean big trouble for the PCjr, whose disadvantages include a strange keyboard, lack of good software for home and education, and its inability to add a second disk drive. The PCjr is a crippled version of the IBM PC, but the Apple IIc is an improved version of the Apple II.

The rapidly growing software base of over 20,000 programs for the Apple II family offers more to homes and schools than the software available for any other computer. The IBM PCjr's software base is tiny compared to that of the Apple. Many software developers feel that the Apple IIc has more potential than the IBM PCjr, and they have been quick to express an interest in creating new software that takes advantage of the IIc's special features.

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## APPLE MOVES IN ON IBM

The 1984 product introductions—the Apple IIc, the Macintosh, and the Lisa 2—now position the Apple computers directly against their IBM competitors. The low end pits the Apple IIc against the IBM PCjr; in the middle, it's the utilitarian IBM PC vs. Apple's IIe, III, and Macintosh; and, at the high end, the IBM PC XT confronts Apple's Lisa 2, Lisa 2/5, and Lisa 2/10.

A dramatic price reduction accompanied the introduction of the Lisa 2. A basic Lisa 2 with 512K RAM now sells for only $3495. For around $5000 you can buy either the IBM PC XT or the Lisa 2/10. Compare the two machines: the Lisa 2/10 with a 32-bit processor has 512K RAM, the ability to run all Macintosh software, one internal 3½-inch microdisk drive storing 400K, and an internal 10-megabyte hard-disk drive. The IBM PC XT with 16-bit processor has 256K RAM, one internal 5¼-inch floppy-disk drive storing 360K, and an internal 10-megabyte hard-disk drive. Which computer delivers the most power for the lower price? The Lisa 2/10 beats the IBM PC XT hands down.

## THE 3-INCH DISK BATTLE

Many different types of 3-inch microfloppies—made by various manufacturers—are vying to become the "standard." Sony Corporation supplies 3½-inch drives and diskettes for Apple's Lisa 2 and Macintosh, as well as for several Hewlett-Packard computer systems and for Sony's own computers. Sony thus gains a sizable advantage over its competitors. Rumor has it that Sony is trying to increase this advantage by working on a double-sided version of its 3½-inch microfloppy, with a storage capacity of 2.5 megabytes. Just right for the Lisa and the Macintosh!

## CHIP CHAT

Western Design Center (WDC) of Mesa, Arizona, is now ready with its much-awaited 65816 microprocessor, a 16-bit processor that is hardware- and software-compatible with the 6502 in the Apple II, II Plus, IIe, and III computers. This innovative new product will enable Apple owners to replace their 6502 microprocessor with the 65816 at a low cost and upgrade their existing system to 16 bits. WDC designed the 65SC02 CMOS version of the 6502 that is used in the Apple IIc.

Motorola's microprocessor division in Austin, Texas, is busy on upgrades for its 68000 series of microprocessors, the type of processor used in the Lisa and the Macintosh. The 68010 virtual-memory chip can address two gigabytes (2,000,000,000 bytes) of memory, the 68020 is a full 32-bit version of the 68000, and the 68032 is a high-end chip with even more features and power.

Here's some good news and some bad news. The good news is that U.S.-made 64K dynamic RAM chips have increased in quality by 300% over the past four years. The bad news is that during the same period of time Japanese RAM chips have increased in quality by 700% and are almost three times more reliable in the field than U.S.-built RAM chips.

## DEVELOPERS TURN TO MAC

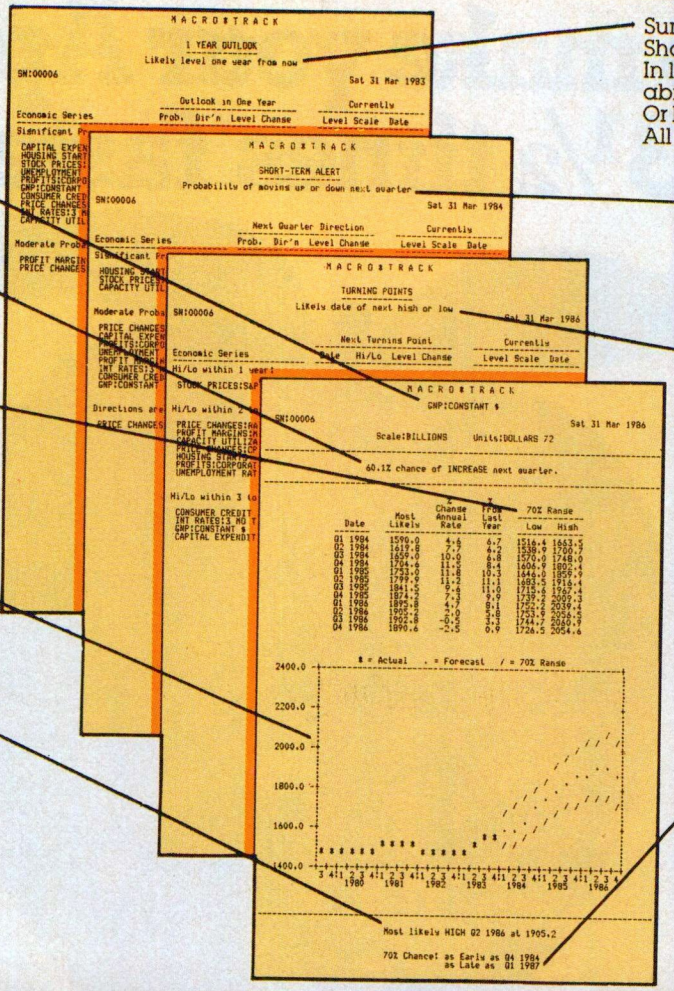
Big-name software and hardware developers, such as Lotus Development Corporation and Tecmar, Inc., who have been focusing their efforts on the IBM PC, are now turning their attention to the Macintosh. The Macintosh attracted more than 100 developers in the first month after its introduction. Bill Gates, chief executive officer of Microsoft, boldly predicted that 50% of Microsoft's 1984 revenues will come from Macintosh products such as Multiplan, Word, Chart, File, and MS-BASIC. Even IBM PC retailers are jumping on the bandwagon—on April 2 BusinessLand added the Macintosh and the Lisa 2 to its product lineup.

## IBM ACRONYM FUN

I was a small child when my father first took me to IBM headquarters in White Plains, New York. From the beginning I had a hard time figuring out what IBM stood for. At first, after seeing the gigantic IBM mainframes, I was sure that IBM stood for "It's a Big Machine."

Later, as a rebellious teenager touring the IBM Executive Development Center in Blaricum, the Netherlands, I cynically thought that IBM must stand for "Impersonal Business Men." I'm still interested in humorous interpretations of the IBM acronym; the funniest one I've encountered so far was at *PC World*, where I heard someone say that IBM stood for "I've Been Manipulated."

I'd like to know what you readers think IBM might stand for. Send your suggestions in, and when I get enough, I'll print the funniest ones here in News+. Send them to: Big Blue Acronyms, c/o Fred Davis, *A+*, 11 Davis Drive, Belmont, CA 94002. I'll pay $10 for each one I use. Have fun! ✚

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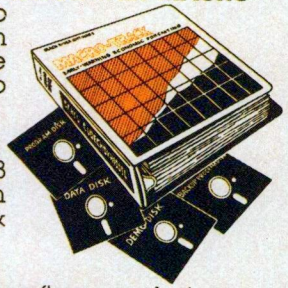


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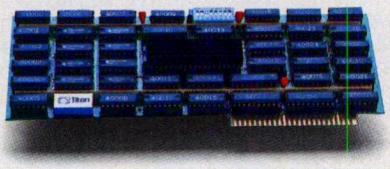

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# APPLE II PLUS HOME REPAIR GUIDE PART ONE

## You can save yourself a bundle if you fix it yourself.

Many of us whose Apple II Plus warranties have expired have to face the possibility of costly repair bills and loss of computer availability. This guide is for Apple II Plus owners who have no knowledge of electronic repair and yet are not overly intimidated by what they find inside the computer. With the techniques described in this article, I have been able to repair more than 30 Apples. To use this guide you must exercise common sense, patience, and a willingness to experiment.

This guide has three installments. This month's section includes an introduction and lists of chip functional groups and their locations within the Apple. Part II will include a diagnostic table and half of a trouble-tree guide. The third installment will consist of the rest of the trouble-tree guide. If you're thinking of tackling repair work on the II Plus, be sure to collect all three parts of this guide.

You won't need any test equipment. We will be taking advantage of the Apple II's unique design and use of standard logic chips. Our basic task will be to identify a malfunction, remove a suspect chip, and swap it with an identical one—in so doing, we will isolate and identify the bad chip.

You have to be extremely careful to swap only identical chips and properly reposition them in their respective sockets. Each chip has a recessed dot and/or a notch in the end nearest to its pin 1. In turn, each motherboard socket has a white dot nearest to its pin 1. In all cases, except with the 6502 CPU and the 2513 character generator, the chip's

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## FUNCTIONAL GROUPS

### A. RANDOM-ACCESS MEMORY

| System Memory Chip Size | Chip Type |
|---|---|
| 4K | MK4096 or MCM 6604 |
| 16K | MK4116, UPD4160, 4716, or 5290 |

Note: With the exception of 48K Revision 7 boards, all other boards have RAM configuration blocks plugged or soldered into locations D1, E1, and F1.

| Chip | Location | Function |
|---|---|---|
| 74LS139 | E2 & F2 | RAM select |
| 74LS153 | C1, E11, E12, E13 | |
| 74LS283 | E14 | RAM address multiplexer |
| 74LS257 | C12 | |
| 74LS174 | B5, B8 | Data latches |
| 74LS257 | B6, B7 | Data bus buffers |
| 8T97 | H3, H4, H5 | CPU tri-state address buffers |
| 8T28 | H10, H11 | CPU Tri-state data buffers |
| 74LS138 | F12 | ROM memory chip select |

### B. VIDEO GENERATOR

| Chip | Location | Function |
|---|---|---|
| 74LS161 | D11, D12, D13, D14 | Synchronization counters |
| 74LS283 | E14 | Screen memory mapping |
| 2513 | A5 | Character generator |
| 74LS166 | A3 | Dot generator |
| 555 | B3 | Clock timer |
| 74LS151 | A9 | Color graphics |
| 74LS194 | B4, B9 | Color-graphics mode shift registers |
| 74LS257 | A8 | Selects color and HGR displays |
| 74LS74 | A11 | HGR timing delay |
| 74LS194 | A10 | Text, color, and HGR select control |
| 74LS151 | A9 | Text, color, and HGR select control |
| 74LS08 | B11 | Video-mode logic gates |
| 74LS11 | B12 | Color control ..... |
| 74LS02 | B13, A12 | ..... |
| 74LS74 | A11 | ..... |

### C. I/O CONTROL

| Chip | Location | Function |
|---|---|---|
| 74LS138 | F13 | I/O address select |
| 74LS74 | B10 | Keyboard flag |
| 74LS74 | J13 | Speaker & cassette |
| 74LS259 | F14 | Soft switches to video and game ports |
| 74LS251 | H14 | Data-bus control |
| 558 | H13 | Quad timer, used for game I/O |
| 74LS138 | H12 | Peripheral slot I/O select control |
| 741C | K13 | Cassette I/O buffer |

### D. KEYBOARD CONTROL

| Chip | Location | Function |
|---|---|---|
| 74LS257 | B6 & B7 | Data latches |
| 74LS74 | B10 | Keyboard strobe latch |

## LOCATIONS

| Chip | Location |
|---|---|
| 74LS00 | A2, Language Card (16K card) |
| 74LS02 | A12, B13, B14 |
| 74LS04 | C11 |
| 74LS08 | B11, H1, Language Card (16K card) |
| 74LS11 | B12 |
| 74LS20 | D2, Language Card (16K card) |
| 74LS32 | C14, Language Card (16K card) |
| 74LS51 | C13 |
| 74LS74 | A11, B10, J13, Language Card (16K card) |
| 74LS86 | B2, Language Card (16K card) |
| 74LS138 | F12, F13, H2, H12 |
| 74LS139 | E2, F2 (not on Revision 7) |
| 74LS151 | A9 |
| 74LS153 | C1, E11, E12, E13 |
| 74LS161 | D11, D12, D13, D14 |
| 74LS166 | A3 |
| 74LS174 | B5, B8 |
| 74LS175 | B1, Language Card (16K card) |
| 74LS194 | A10, B4, B9 |
| 74LS195 | C2 |
| 74LS251 | H14 |
| 74LS257 | A8, B6, B7, C12, J1 |
| 74LS259 or 9334 | F14 (either chip will work. Revision 7 comes with 9334) |
| 74LS283 | E14 |
| 555 or LM1455 | A13, B3 |
| 558 or NE558 | H13 |
| 8T28 | H10, H11 |
| 8T97 | H3, H4, H5 |
| RA01 or 741C | K13 |
| 2513 | A5 (character generator for Revision 6 and older) |
| 341-0036-00 | A5 (character generator for Revision 7 Apple IIs) |

| Memory Chips | |
|---|---|
| 4716, 4116, or 5290 | Row 1: C3 to C10<br>Row 2: D3 to D10<br>Row 3: E3 to E10<br>Additional source: Your 16K Language Card has 8 good RAM chips. |

| Applesoft ROM Chips | |
|---|---|
| 341 0020 8036 CHIP F8 | F3 |
| 341 0015 8032 CHIP F0 | F5 |
| 341 0014 8036 CHIP E8 | F6 |
| 341 0013 8021 CHIP E0 | F8 |
| 341 0012 8036 CHIP D8 | F10 |
| 341 0011 8035 CHIP D0 | F11 |

| CPU | |
|---|---|
| 6502 | H7 |

pin 1 goes to the right-front corner of each socket, nearest to you, while you are facing the computer. For removing chips and straightening any bent pins, large tweezers do the trick. Use a gentle rocking motion and lift the chips straight up and out.

This guide includes an index of all the chips and their locations. Use this index to locate a compatible chip that you can swap with the suspect chip. Most of these chips are standard logic chips and cost less than a dollar apiece. Compare that with the price of a shop service call, and swapping or buying a chip, even if you're not sure which one you need, will seem quite acceptable. Also, you will build up a supply of replacement chips.

Many chips have the letters LS, which signify low power consumption, in the third and fourth places of their labels (i.e., 74LS04). Ideally, all your chips should have the LS marking, but they don't have to. A 7404 will work just as well as a 74LS04.

**Getting Started**

Before we begin, we have to strip the Apple down to its basic configuration. Turn off the computer, remove all peripheral cards, and turn the machine back on. Note: You may have to press the Reset button to intialize the computer if it is Revision 6 or older.

If the computer now works, your problem is most likely a malfunctioning peripheral card. Turn the power off, plug in one of the cards, and turn the machine back on. Repeat this process until you identify the malfunctioning card. If you get beyond this stage, you may have the rare problem of two peripheral cards that are incompatible. In this case, replace all of the cards and remove them one at a time until the malfunction is identified. Using this process of elimination, you will be able to identify the problem peripheral card or cards, which should be repaired or replaced by a reputable dealer.

**You will come to appreciate the Apple II Plus's use of standard logic chips.**

If you still do not get a power-on light or the power supply is emitting a clicking noise, stop, turn the power supply off, and unplug it from the motherboard. If you turn it on again, the power supply should issue a clicking noise; if it doesn't, it needs shop servicing. The power supply should not click while it is plugged into the motherboard unless you have a serious short- or open-circuit.

If the computer beeps to indicate a problem and you get either snowy video or no video at all, check the video connector in the back of the Apple for broken or short-circuited connections. The video connector in back of the Apple has a weak center structure and breaks easily.

If the above procedures do not clear up the malfunction, proceed with this guide; otherwise, stop now, because this guide cannot help you. **Never work in the Apple with the power cord plugged in.** You can severely hurt yourself and damage the computer.

After you have assembled the three parts of this guide and have worked with it a few times, you will come to appreciate the Apple II Plus's use of standard logic chips. It is one of the last personal computers to use off-the-shelf logic chips and parts. Most of the newer computers have gone to highly complex and specialized components. While their owners are paying costly service bills, you will be able to fix your Apple with parts from the local hobby shop. ✚


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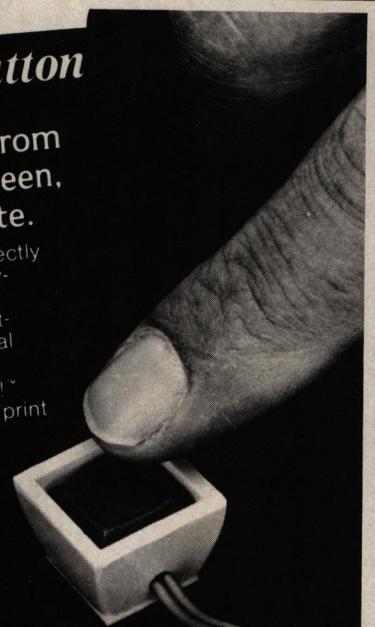

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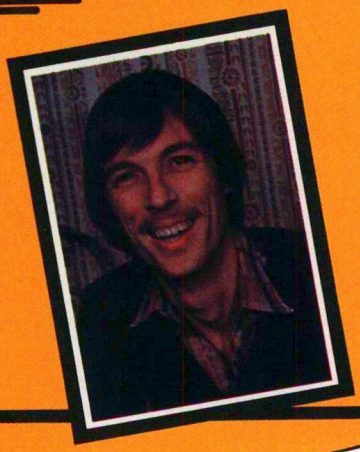

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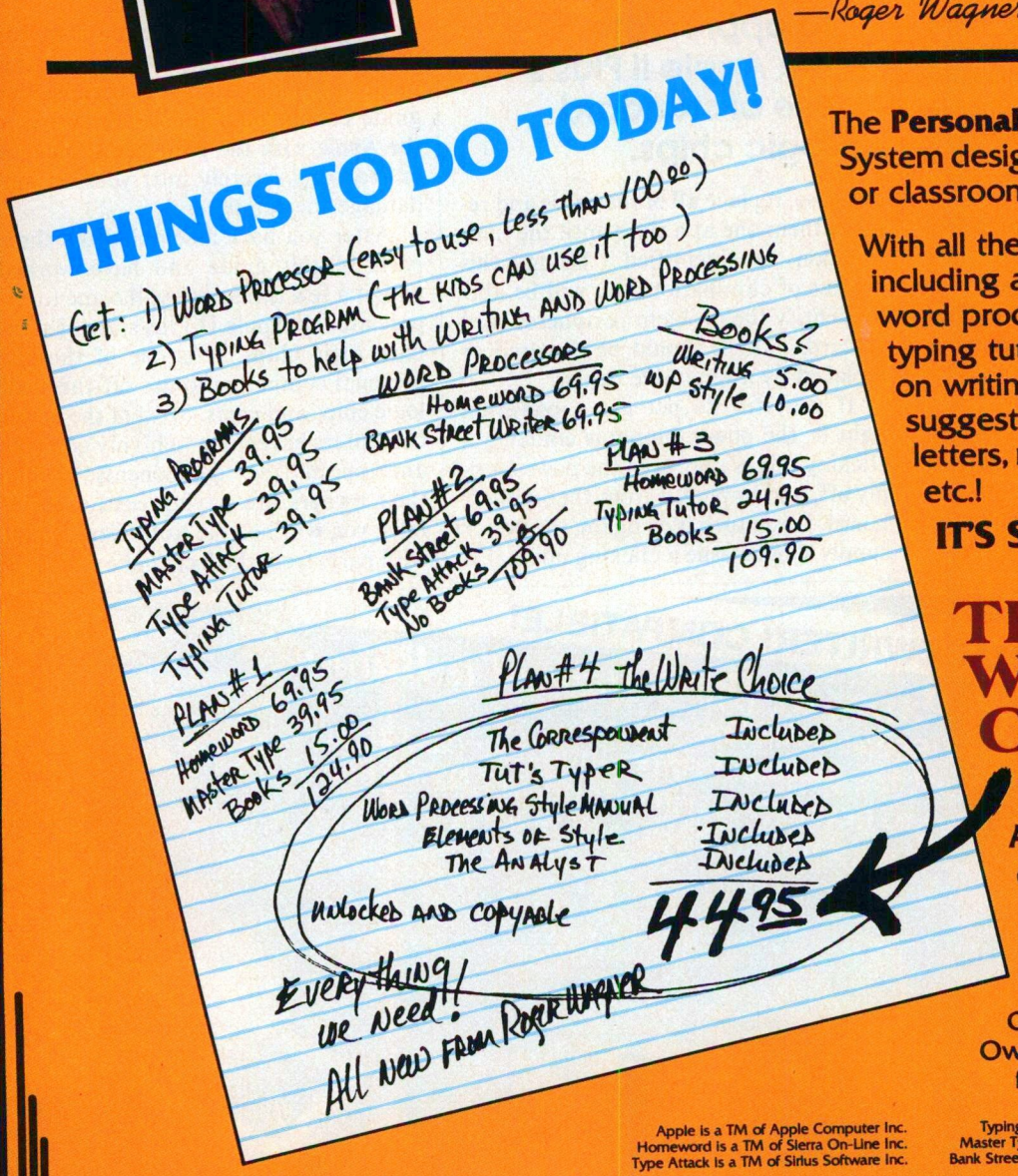


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## The Apple III Plus

# A STRONGER SUIT

### The next step in the Apple III's evolution

After several years of success with the Apple II, Apple Computer announced a new machine, the Apple III. This computer was a sophisticated 8-bit machine whose design incorporated many advanced concepts. One of its revolutionary design elements was that it had no operating system in read-only memory (ROM). Thus, the machine had no instructions except those that performed a small self-diagnostic test when you turned on the power and that began to boot whatever diskette you loaded into the internal drive.

Information on the start-up diskette contained the instructions that determined the functions of the machine. This approach offered extra flexibility for designing operating systems and software for the Apple III.

The operating system that Apple developed was called SOS, short for Sophisticated Operating System. And it was. SOS has three separate but interwoven sections that compose SOS: the Kernel, the Driver, and the Interp files.

The Kernel is the core of the operating system. The Driver is actually a group of smaller files that define how all of the devices connected to the computer operate. These files control the devices, such as the disk drives, freeing the system designer from the obligations of creating special software to control the various devices. Finally, we have the Interp file, which links the operating system to the application software, such as BASIC, Pascal, a communications program, and the like.

The Apple III had graphics abilities that were twice as good as those of its predecessor, the Apple II, and it outshone most of the other off-the-shelf computer brands. Thus, the announcement of the Apple III created eager anticipation.

**Shaky Start**

When the III arrived, however, it was plagued by problems. Dealers had a difficult time configuring the SOS .DRIVER routines for external devices such as printers and modems. Where starting out with an Apple II had been a case of simply plugging a card in, the Apple III required special device drivers. Also, the manuals were inadequate—for dealers as well as users—and Apple provided only scanty explanations.

The physical design of the Apple III created problems with overheating. The motherboard was densely packed with chips, which generated heat. The heat rose, warmed the memory chips above the motherboard, and also heated the chips on the disk-controller card. Like all other Apple computers, the Apple III has no exhaust fan—convection cools it. The fan is one of the noisiest parts of a microcomputer, and Apple's omission of this component resulted in a relatively quiet machine.

Heat makes objects expand, however, and the absence of heat causes expanded objects to contract. The boards, the chips—everything inside an Apple III—suffered this expansion and contraction every time anyone used the machine. Before you knew it, certain chips stopped working. Apple tried to remedy this dilemma by paying dealers to open the machines and press the chips back into their sockets, but the faulty design caused the same problem to recur.

Apple Computer had just gone public with its stock, and many rumors circulated that the Apple III had been released prematurely to enhance Apple's stock value. Not surprisingly, sales of the original version of the Apple III were disappointing.

**Second Try**

About a year later, Apple reintroduced the III. This time a new internal hardware design promoted the dispersion of heat. The new manuals were clear and comprehensive. Apple dropped the original 96K RAM configuration, so the III came with 128K, expandable to 256K. And straight out of the *Tales of the Arabian Nights*, hawking new lamps for old, Apple did something that no computer company had ever done. Everyone who owned one of the old, problem-laden machines (with a serial number below 14000) received a new Apple III. Apple took back the older computers and replaced them without any additional cost to the owners. Such a move was unprecedented in the computer industry and remains the sole example of its kind.

Now the Apple III worked, and it worked well. The machine still suffered from a lack of positive marketing, however. Another problem was that third-party manufacturers lacked incentive to create add-on boards and software, the key to success for the Apple II.

During the next two years, Apple realized that quite a bit of research-and-development money was tied up in the Apple III and that the company had spent no small sum replacing the old machines and supporting the new ones.

Apple lowered the prices of the Apple III product line and set the minimum memory of the machine at 256K. The company also established an independent marketing unit to promote the III and began supporting vendors in the development of aftermarket hardware and software. In the fourth quarter of

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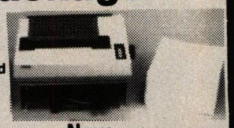

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Reducing the chip count in the Apple III Plus main memory board (above right) means reducing the number of chips that produce heat as well. See the combination of +5 and +12 volt chips on the older board (above left). Also noteworthy are the keyboard improvements (far right) incorporated into the Apple III Plus.

1983, Apple released a booklet listing software available in the United States and Great Britain called *Can Anyone Please Tell Me What An Apple III Can Do?* which helped potential buyers assess the computer's capabilities.

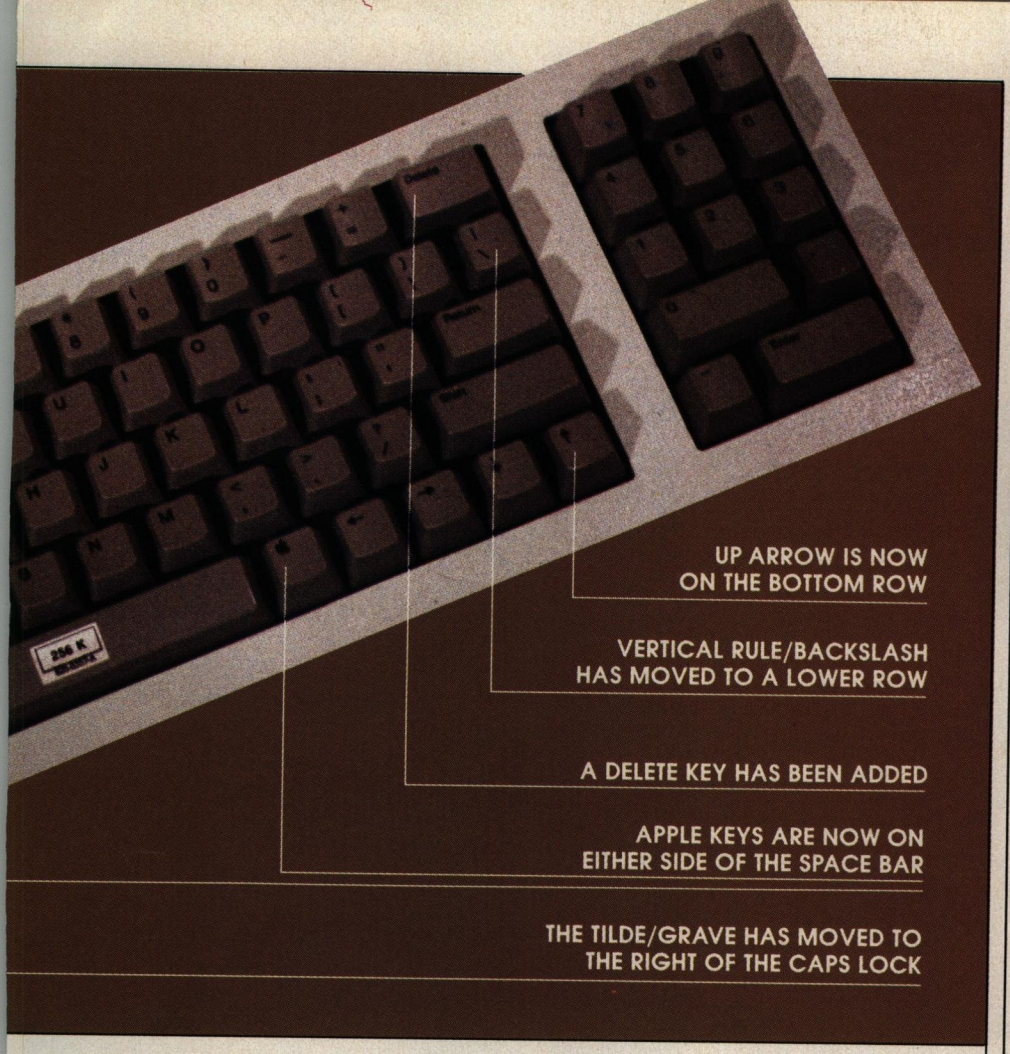
**And Now the III Plus**

The Apple III was now a viable piece of hardware with almost weekly additions to its software library—which brings us to the present. The first quarter of 1984 saw a slight change to the Apple III. It has become the Apple III Plus.

To align its products, Apple has renovated the III's keyboard, making it more compatible with the Apple IIe. The open- and closed-apple keys, modifiers of the standard ASCII character set, are now on either side of a slightly shorter space bar. All arrow keys are on the bottom row, where the tilde/grave key now resides (just to the right of the Caps Lock key). A new addition is the Delete key at the upper right corner of the main keyboard. With this key, the III has an ANSI standard keyboard that lets it compete in the terminal marketplace. To accommodate the Delete key, the vertical rule/backslash key is one row lower than its old location.

The rear panel still has the same connectors, but gone are the written descriptions of their functions. In their place are international symbols. The meaning of one, a telephone superimposed over a row of binary 0's and 1's, might elude some people. It's the serial communications port. The power-on switch is slightly wider than before, and a DB-25 female plug, common in RS-232 serial applications, has replaced the blue, ribbon-type connector for the external disk drives.

For those who would like to cross over from a standard Apple III, Apple will offer an intermediate adapter that converts the new type of plug into the old. To experienced microcomputer users, the inherent difficulties of having two identical connectors with dissimilar functions should be obvious. RS-232 signal levels commonly vary between +12 and -12 volts to indicate either true or false conditions. TTL (transister-translator logic) signals occurring in data transfer between computer and disk drive are usually between 0 and +5 volts. The 12-volt signal from the RS-232 communications line could overload the circuits in the 5-volt disk-drive circuitry, which could cause permanent damage—it might even catch on fire. Apple did come up with a pre-




ventive measure, however.

The solution was a simple matter of engineering. RS-232 operations use pin 7 as the ground connection to complete the voltage path. The DB-25 terminated cable that Apple decided to use between the computer and the disk drive has no pin 7, though, which prevents completion of the electrical path, greatly reducing mishaps.

**Gone are the squat brown RFI shields that made the Apple III motherboard resemble a suburban housing development.**

The inclusion of this new style of connector and the stretching of the power switch created a space problem that Apple solved by transplanting the audio port to a position just above the black-and-white video jack. The two plugs are hard to confuse. The audio connector is a female miniplug, and the video is a female RCA plug. They are, however, situated very close to each other, which may cause difficulties. Different manufacturers supply cables and connectors of different dimensions. These dimensions include the diameter of the barrel that the physical male connector resides in. The wider the barrel, the easier it is to grasp the plug for removal or insertion. Unfortunately, if both plugs have wide barrels, they will lean against each other, which will result in instability.

The bottom panel of the Apple III Plus is a vivid testimonial to Apple's healthy respect for convection cooling on the fanless machine. With this type of a system, hot air rising from the top draws cool air in through the bottom. Instead of the fans that dissipated heat on the original computer, the III Plus has bent holes for the influx of cool air on the bottom panel and warm-air holes in the upper section of the casing.

One other external modification is a two-position switch on the right side of the III Plus, just below the cover. The switch controls a feature, called interlacing, that maintains the screen display, as it appears on the monitor, in memory. Additionally, a spare copy of the screen image is stored elsewhere in RAM. With interlacing off, everything on the screen seems normal. You can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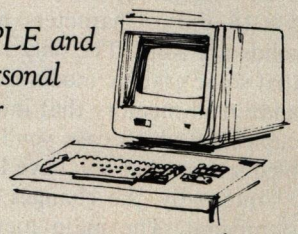

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## APPLE III PLUS SYSTEM

**SIZE**
17.5 inches wide (44.45 cm)
18.2 inches deep (46.23 cm)
4.8 inches tall (12.19 cm)
Cast-aluminum base with molded plastic cover

**WEIGHT**
26 pounds (11.8 kg)

**PROCESSOR**
Based on 6502B with extended addressing capability

**CLOCK SPEED**
2 Mhz peak, 1.4 Mhz average

**MAIN MEMORY**
Minimum 128K of dynamic random-access memory

**ROM MEMORY**
4K (initialization and graphics)

**POWER SUPPLY**
High-voltage switching type, +5, -5, +12, -12 volts. 1 Amp UL/CSA approved

**POWER REQ.**
100 watts max., 107 to 132 bolts, 60 Hz

**AMBIENT TEMP.**
0–45 degrees Celsius (32–113 F). Critical factor is the temperature at which the disk case can warp.

**MASS STORAGE**
Built-in 5¼-inch flexible disk drive, 140K bytes per diskette. Up to three additional drives can be connected by daisy-chain cables. Built-in disk controller.

**KEYBOARD**
75 keys (62 on main keyboard, 13 on numeric pad)
Full 128 ASCII characters
All keys have auto-repeat except modifier keys
Five modifier keys: Shift, Control, Alpha Lock, Open Apple, Closed Apple
Four directional arrow keys with two-speed repeat
Five special keys: Tab, Escape, Return, Enter, Delete
All keys redefinable
Keyboard is fully interrupt-driven

**SCREEN**
Three text modes:
40 × 24 black and white, normal and inverse
80 × 24 black and white, normal and inverse
560 × 384 dots with interlace
40 × 24 16 colors, foreground and background
All text modes have a software-definable 128-character set
Four graphic modes:
280 × 192 black and white
280 × 192 16 colors, foreground and background
140 × 192 full 16 colors
560 × 192 black and white

almost count the 5 × 8-dot matrix that forms each character cell as the letters appear on the screen. Solids exhibit thin, empty lines between the rows of cells. Activating the Interlace function superimposes the second copy of video memory, shifted one-half character over, elongating the cell matrix to 5 × 16 dots. Characters appear full; solids are solid. The only restriction is that some graphic modes may need the additional memory that interlacing occupies, in which case you'll see a garbled image when you have Interlace on.

Internally, the changes are not too significant. The main memory board accommodates only two rows of chips, down one from the amalgamation of memory devices in the original Apple III. Gone are the squat brown RFI (radio-frequency interference) shields that made the Apple III motherboard resemble a suburban housing development.

The gaping hole that, on the original, was designed to accommodate the battery backup for the internal clock, is missing. In its place are two connectors that accept wire plugs from the Interlace switch and the battery pack affixed to the front of the casing, beneath the cover.

On the motherboard itself, the most notable inclusions are the clock chip and double the III's number of blue tantalum capacitors, which filter power to some of the chips. These capacitors help prevent I/O (input/output) and processing errors that electrical problems can cause.

The only evident software change involves the SOS Utilities diskette. When you use the File Handling option, listing the directory of a diskette produces a list of statistics that is slightly different from that of the III. No longer does the list show you when you created a file; rather, it gives you the time and date of the latest modification of the file. Whereas the original program listed the block length and byte length separately, the new program lists one length field that contains the block length, a colon, and the byte length.

An alteration of the System Configuration Program (SCP) prevents modifications to the driver device type and subtype. Although this change may seem minor, I've already encountered one program that recognizes Apple's UPIC driver but not Interactive Structures' PKASO driver—the two drivers have different device types. With the new SCP, you cannot modify the PKASO driver to accommodate the program. Thus, you should retain or acquire an older copy of the utilities.

Another addition to the package is a set of two informative diskettes called "Apple Presents . . . The Apple III Plus." This time around, Apple also gives you a system-utilities tutorial diskette and manual, a pleasant thread through the labyrinth of possibilities. For the diehards, the package still includes a standard system-demonstration disk.

All in all, the Apple III Plus does not represent many critical changes. It has undergone some simple cosmetic and electronic massaging, much the same as those the Apple II underwent in its transformation into the Apple II Plus. In this case, however, software developed on the older machine can run on the new.

One program I received recently got me thinking. The software's operating-environment description called for an Apple III with *at least* 256K of memory. The III Plus is capable of supporting 512K, although Apple is not yet offering this amount of memory. Perhaps, as the Apple II Plus evolved into the IIe, the III may eventually evolve into the IIIe. +

# SPECIFICATIONS

**VIDEO OUTPUT**
RCA phono connector for NTSC black-and-white composite video
DB-15 type connector for:
NTSC black-and-white composite video
NTSC color-composite video
RGB pure video
Composite sync signal
P5, -5, +12, -12 volt power supplies
Color signals appear as 16-level gray scale on black-and-white video outputs.

**AUDIO OUTPUT**
Built-in two-inch speaker
Miniature phone-tip jack on rear panel
Three different audio generators:
64-level audio port (6-bit DAC)
One-bit square-wave generator
Fixed-frequency "beep" generator

**DISK I/O**
One DB-25 connector supporting up to three daisy-chained Disk III drives

**SERIAL I/O**
RS-232C compatible
DB-25 female connector
Software-selectable baud rate and duplex mode

**JOYSTICKS**
Two DB-9 connectors for two joysticks, each with two push buttons

**PRINTER**
One DB-9 connector (shared with first joystick) for Silentype printer

**EXPANSION**
Four 50-pin expansion slots inside case

**AVAILABLE KEYBOARD DEFINITIONS**

| | |
|---|---|
| SHOLES | GERMAN |
| DVORAK | ITALIAN |
| BRITISH | SPANISH |
| FRENCH | SWEDISH |
| FRENCH CANADIAN | |

**FILE TYPES**

| | |
|---|---|
| **SOSFILE** | part of the operating system |
| **DIRECTORY** | a subdirectory file |
| **TEXTFILE** | a file of characters with formatting data |
| **CODEFILE** | a machine-language program file |
| **BASICPROG** | a BASIC program |
| **ASCIFILE** | a file of characters without formatting data |
| **FONTFILE** | a character-set file |
| **FOTOFILE** | a screen-image file |
| **WPFILE** | a file created by some word-processing programs |
| **UNKNOWN** | a file of unknown type |
| **BADFILE** | a file flagged to indicate bad blocks |
| **TYPExx** | a program-dependent file numbered in the hexadecimal (*xx*) system |


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The sequence of instructions:

```
LDA P ; LOAD P
CMP Q ; COMPARE WITH Q
BMI L ; BRANCH ON MINUS
```

on the 6502 does *not* always branch to L if P-Q is negative, i.e., P<Q. Why not?

Read section 28 of —

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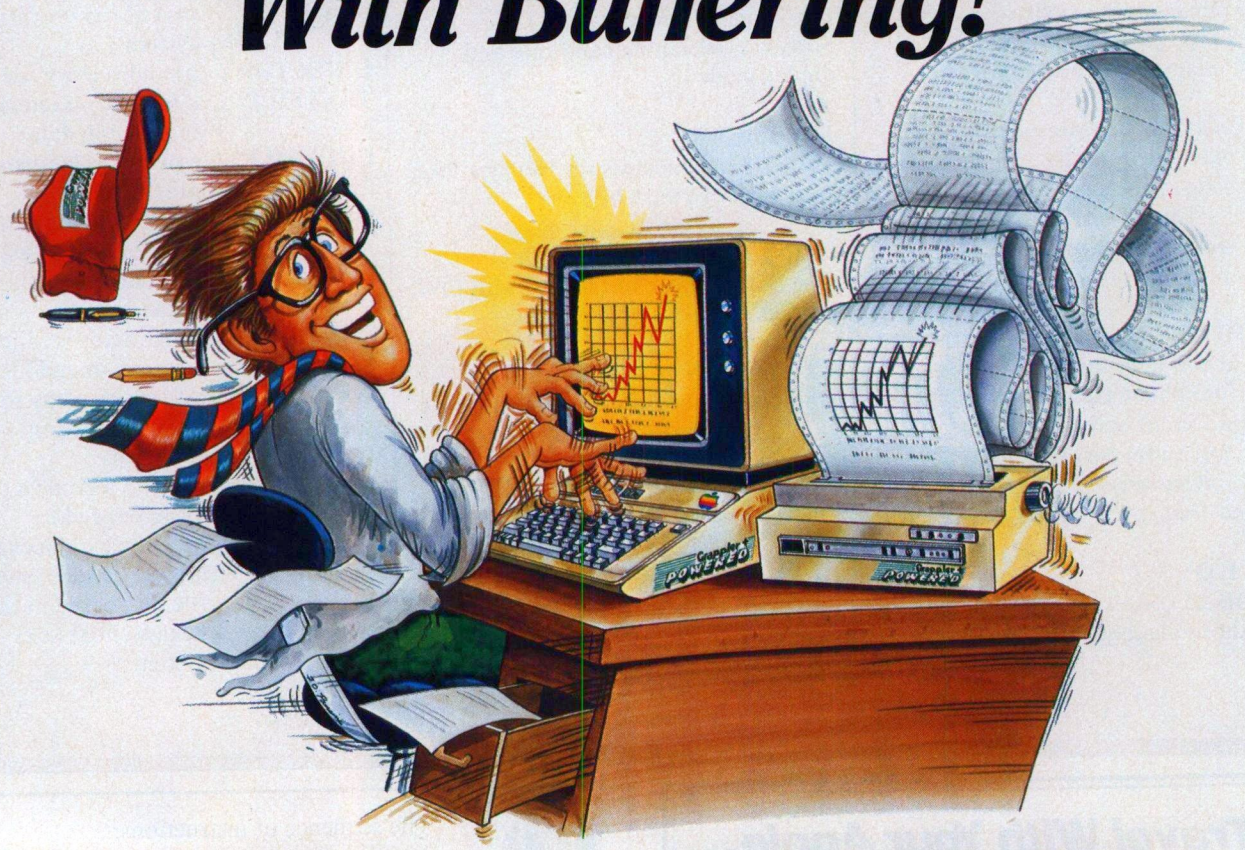

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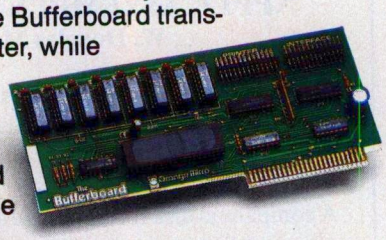


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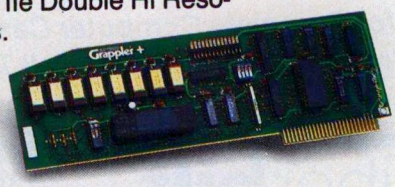


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# HOW TO dBASE II

## PART VIII

**In a tutorial series on dBase II, a popular program for database management**

Welcome to our ongoing series of tutorials on the increasingly popular microcomputer data-management tool dBASE II. If you have been following along through the last seven installments in *A+*, you should now be fairly adept in many of the rudimentary, as well as some of the more complex, techniques for creating databases, storing information in them, and keeping that information up-to-date. We've also covered most of the approaches for data retrieval, including the use of sorted and indexed databases, character-string searches, and the various types of "operators" and memory variables.

This time, we'll dig a bit deeper into dBASE to experiment with some really powerful commands that manipulate (and even create) entire databases, not just a few records. These commands create large-scale modifications of and interactions between existing data files, resulting in substantial time savings, particularly with large and complex applications.

In this and future issues, we will explore dBASE's ability to use two databases simultaneously (Select Primary/Secondary); two commands for batch modifications to existing databases (Append From and Update); and, finally, a powerful command for creating a new database from information in two existing ones (Join). But first, a few notes:

**Tutorial Conventions**

These tutorials contain numerous examples. Sometimes you are asked to type in a command, and then dBASE II responds. Just to differentiate between what you do and what dBASE II responds with, the ones you type appear in lowercase letters. Uppercase works too, so it doesn't really make a difference; it's just clearer this way. Some examples may specifically ask you to type in uppercase, but they always involve a series of words between quotes. The dBASE II responses are usually in uppercase letters. All screen interactions are listed in special type to distinguish them from the rest of the text. To make these sections more readable, carriage returns are implied rather than included here.

In the command-syntax examples, words between square brackets (e.g., [scope]) indicate an optional phrase or "argument."

In some of the examples, the command lines (the part you type) are too long to fit in one of our column lines. In these cases, you'll find a semicolon where the break occurs. Don't type this semicolon; just continue typing the command, and then press Return.

**From There to Here**

Say you've got two stores, each with its own inventory, which you keep track of with dBASE II files, of course. One day you stumble across a great deal on a warehouse and decide it makes sense to merge all the inventory into one loca-

tion, while expanding the floor space in your stores. This step means combining your databases as well, but do you want to pay someone to type all the information from one file into another? No. Instead (having read the *A+* tutorial) you employ the services of the Append From . . . command. Here is the complete syntax:

```
APPEND FROM <file> [FOR <exp>];
[SDF] [delimited]
```

(Remember, the bracketed phrases are optional, and the <> phrases are required.) For starters, let's use the simplest form of Append to combine your two inventory files (Inv-1 and Inv-2). You should recognize the first one from the April issue, page 135, where it was named Inventory.DBF. If you don't have it around, recreate it. If you still have it, just rename it Inv-1 (from dBASE: <Rename inventory to Inv-1>) and compare its structure to what appears in figure 1. Then create the Inv-2 file, using the structure of Inv-1 (with the Copy Structure command) and append it with the new data in figure 1. Then follow the procedures in figure 1.

Notice the last four records? dBASE just tacked them onto the bottom of Inv-1. It also reported to the screen the number of records that it added. Appending four records was a swift process, but a few thousand would take considerably more time and disk space. Be sure you have enough of both in such cases.

```
. use inv-1
. display structure
FLD          NAME                TYPE          WIDTH      DEC
001          PART:NUMB           N             005
002          CATEGORY            C             010
003          BRAND               C             010
004          MODEL               C             006
005          QUANTITY            N             002
006          COST                N             006        002
007          PRICE               N             006        002

. list
00001      1 RECEIVER   NIZO       T-33        5        225.49      350.49
00002      2 RECEIVER   NIZO       T-35        4        312.00      425.25
00003      3 RECEIVER   ACME       R25-MT     13         19.99       49.99
00004      4 RECEIVER   NADIR      2-CHP      50         12.95       29.99
00005      5 SPEAKERS   RAZCO      L-55       30        199.00        0.00
00006      6 SPEAKERS   TALBEST    BG-20       6        250.00      350.88
00007      7 TAPE DECK  ROLLEM     CAS-3      10        125.65      212.99
00008      8 TAPE DECK  FLOWUTTER  WBL-5       5        149.33      250.77
00009      9 TURNTABLE  XIRTAM     25-L        5         99.99      149.99
00010     10 TURNTABLE  RALURIC    RND-1       3        595.00      850.00

. use inv-2
. list
00001     656     snowshoes   Sno Ball   zl-5      49        25.00      39.95
00002    8889     goggles     Jennings             26        10.00      15.99
00003     199     snorkels    Schearshs  SNK-4     48        16.54      25.50
00004     777     flippers    Web        flp       67        20.00      32.95

. use inv-1
. append from inv-2
00004 RECORDS ADDED
. list
00001       1     RECEIVER    NIZO       T-33       5        225.49      350.49
00002       2     RECEIVER    NIZO       T-35       4        312.00      425.25
00003       3     RECEIVER    ACME       R25-MT    13         19.99       49.99
00004       4     RECEIVER    NADIR      2-CHP     50         12.95       29.99
00005       5     SPEAKERS    RAZCO      L-55      30        199.00        0.00
00006       6     SPEAKERS    TALBEST    BG-20      6        250.00      350.88
00007       7     TAPE DECK   ROLLEM     CAS-3     10        125.65      212.99
00008       8     TAPE DECK   FLOWUTTER  WBL-5      5        149.33      250.77
00009       9     TURNTABLE   XIRTAM     25-L       5         99.99      149.99
00010      10     TURNTABLE   RALURIC    RND-1      3        595.00      850.00
00011     656     snowshoes   Sno Ball   zl-5      49         25.00       39.95
00012    8889     goggles     Jennings             26         10.00       15.99
00013     199     snorkels    Schearshs  SNK-4     48         16.54       25.50
00014     777     flippers    Web        flp       67         20.00       32.95
```

*Figure 1: Combining two inventory files*

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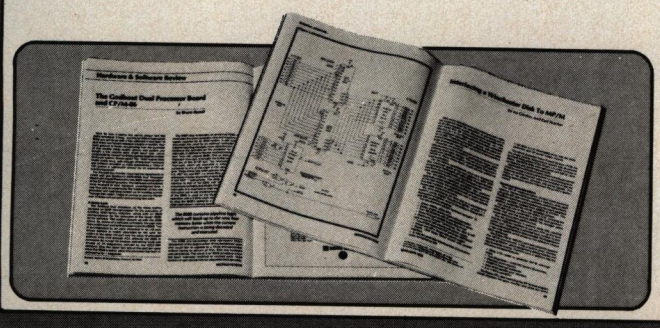

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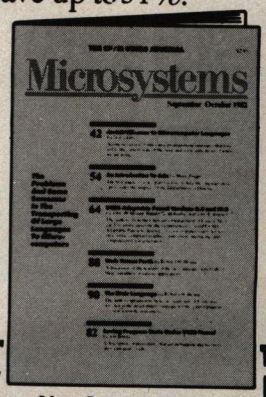


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Now for a few technical points. Luckily, both your databases had identical structures, field names, and field lengths. Would discrepancies have caused problems? What are the rules? To answer these questions, let's consider what dBASE II does when it gets an Append From . . . command. First it compares the structures of the two databases concerned and appends only fields with the same names. Otherwise, it skips over them. If the data in the From field is too long to fit into the new field, the program shortens (truncates) it until it fits.

What if the fields of the two databases are in a different order? Well, let's try it. First we will rearrange the order of the fields in the Inv-2 file, using the Copy command with the Field clause. This process creates a new file called Inv-3 with the fields in reverse order—see figure 2. (Compare the structure listing in figure 1.)

Two things to remember: If you need to, you can rearrange database fields using Copy, but you don't have to for appending from another database.

So much for simply appending all the records from another database. What about specifying some conditions that choose which records to add? For example, say you want to add only inventory items with part numbers greater than 8000? This selectivity requires using the first optional clause, [FOR <exp>]. (The <exp> stands for *expression*, by the way.) See figure 3.

You can use much much more complex expressions such as those we've covered in previous issues, but the important thing to remember is that any fields you reference in your expression must exist in both files. This restriction can be confusing, since the expression refers only to data in the From file. For some reason, dBASE just can't handle an expression relating to fields that exist only in the second file, probably because dBASE isn't actually "using" that file. You might want to look into the Join command to get around this limitation.

The last two optional clauses, [SDF] and [Delimited], refer to the format of the From database. Suppose you only

```
. copy to inv-3 field price,cost,quantity,model,brand,category,part:numb
00004 RECORDS COPIED
. use inv-3
. display structure

FLD                NAME                    TYPE          WIDTH      DEC
001               PRICE                     N             006       002
002               COST                      N             006       002
003               QUANTITY                  N             002
004               MODEL                     C             006
005               BRAND                     C             010
006               CATEGORY                  C             010
007               PART:NUMB                 N             005

.list
00001     39.95     25.00     49     zl-5     Sno Ball    snowshoes    656
00002     15.99     10.00     26              Jennings    goggles     8889
00003     25.50     16.54     48     SNK-4    Schearshs   snorkels     199
00004     32.95     20.00     67     flp      Web         flippers     777

. .use inv-1
. append from inv-3
00004 RECORDS ADDED

. list
00001      1     RECEIVER   NIZO       T-33      5      225.49     350.49
00002      2     RECEIVER   NIZO       T-35      4      312.00     425.25
00003      3     RECEIVER   ACME       R25-MT   13       19.99      49.99
00004      4     RECEIVER   NADIR      2-CHP    50       12.95      29.99
00005      5     SPEAKERS   RAZCO      L-55     30      199.00       0.00
00006      6     SPEAKERS   TALBEST    BG-20     6      250.00     350.88
00007      7     TAPE DECK  ROLLEM     CAS-3    10      125.65     212.99
00008      8     TAPE DECK  FLOWUTTER  WBL-5     5       14.33     250.77
00009      9     TURNTABLE  XIRTAM     25-L      5       99.99     149.99
00010     10     TURNTABLE  RALURIC    RND-1     3      595.00     850.00
00011    656     snowshoes  Sno Ball   zl-5     49       25.00      39.95
00012   8889     goggles    Jennings           26       10.00      15.99
00013    199     snorkels   Schearshs  SNK-4    48       16.54      25.50
00014    777     flippers   Web        flp      67       20.00      32.95
00015    656     snowshoes  Sno Ball   zl-5     49       25.00      39.95
00016   8889     goggles    Jennings           26       10.00      15.99
00017    199     snorkels   Schearshs  SNK-4    48       16.54      25.50
00018    777     flippers   Web        flp      67       20.00      32.95
```

*Figure 2: Rearranging the order of the fields in one inventory file and appending it to another inventory file*

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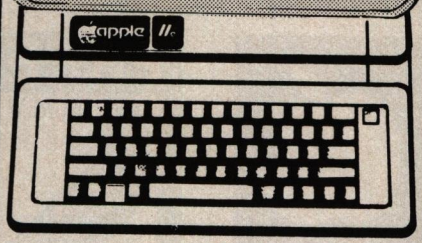


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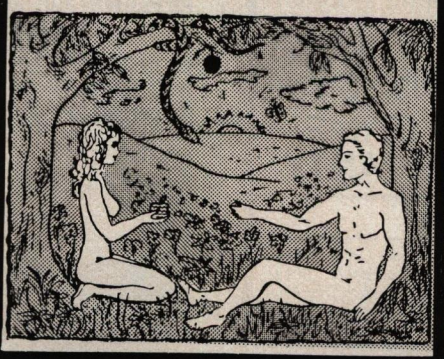

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recently decided to use dBASE II for your inventory records. Up until now, you created and maintained all your files with monstrous BASIC programs (or maybe COBOL or another language). Now you want to use dBASE II to simplify your programming chores. Using the SDF or Delimited options, you can read your "foreign" data files into a dBASE II file, but doing so usually takes a little work.

First, you may have to "massage" your BASIC or other file, using whichever high-level langauge you wrote it with. Make sure to convert numbers into character strings to simplify the translation. Next, create a dBASE II file that is as similar as possible to the foreign file in terms of field length and order. Here is a sample program that converts a "random" customer list from BASIC to dBASE II format. Notice line 45, which formats a phone number with dashes.

```
10 ' READ DATA FILES TO FOREIGN FORMAT
15 ' CHANGE 20 AND 26 FOR YOUR FILENAMES
20 OPEN "R", 1, "B:CUSTLST.003", 152
25 FIELD #1, 152 AS R$
26 OPEN "O", 2, "B:CUSTLST.TXT"
30 GET #1
40 PRINT #2,MID$(R$,3,133);
45 PRINT #2, "-";MID$(R$,134,3);"-
   ";MID$(R$,137,4)
90 IF EOF(1) THEN STOP ELSE GOTO 30
110 END
```

The file, our Inv-2 file in SDF format, should look something like this when you view it or print it out. Notice that the fields run together, but the field lengths are actually cor-

```
. use inv-1
. append from inv-2 for part:numb>8000
00001 RECORDS ADDED

00001        1    RECEIVER    NIZO       T-33      5    225.49    350.49
00002        2    RECEIVER    NIZO       T-35      4    312.00    425.25
00003        3    RECEIVER    ACME       R25-MT    13     19.99     49.99
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00011     8889    goggles     Jennings             26     10.00     15.99
```

*Figure 3: Specifying which records dBASE will add*


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| Death in the Caribbean | 26.00 |
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| Bats in the Belfry | 20.00 |
| Mad Rat | 16.00 |
| Diamond Mine | 22.00 |
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| How about a nice game of Chess | 23.00 |
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## HARDWARE

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|---|---|
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| Apple Daisy Wheel | 1,826.00 |
| **BROTHER** HR 25 | 775.00 |
| **DIABLO** | |
| 620 | 850.00 |
| 630 | 1,785.00 |
| **DYNAX** | |
| DX-15 | 465.00 |
| **EPSON** | |
| FX-80 | 570.00 |
| FX-100 | 700.00 |
| RX-80FT | 415.00 |
| **IDS** | |
| Prism 80 (Basic) | 1,080.00 |
| Prism 80 (Full) | 1,385.00 |
| Prism 132 (Basic) | 1,240.00 |
| Prism 132 (Full) | 1,675.00 |
| Microprism | 450.00 |
| **JUKI** 6100 | 450.00 |
| **MANASMAN TALLY** | |
| 160L | 599.00 |
| 180L | 820.00 |
| 1602P | 1,325.00 |
| **OKIDATA** | |
| 92P | 470.00 |
| 93P | 720.00 |
| **PROWRITER** | |
| 8510SP | 520.00 |
| 8510AP (ProWriter I) | 365.00 |
| 1550AP (ProWriter II) | 655.00 |
| F-10 (40 cps) | 1,125.00 |
| **SMITH CARONA** TP-1 | 499.00 |
| **STAR MICRONICS** | |
| Gemini 10X | 320.00 |
| Gemini 15X | 409.00 |
| Power Type | 375.00 |
| **TRANSTAR** | |
| 120P | 430.00 |
| 130P | 605.00 |
| 140P | 1,235.00 |
| 315 | 470.00 |
| Pics Card | 96.00 |
| —*DISK DRIVES*— | |
| **APPLE** Apple Add On | 350.00 |
| **MICRO SCI** | |
| Disk Contr. for A2 | 75.00 |
| Disk Contr. for A40/70 | 75.00 |
| A2 | 230.00 |
| A2 w/controller | 295.00 |
| A40 | 295.00 |
| A40 w/controller | 365.00 |
| A70 | 365.00 |
| A70 w/controller | 445.00 |
| **RANA** | |
| Disk Controller | 95.00 |
| Elite I | 275.00 |
| Elite I w/controller | 360.00 |
| Elite II | 445.00 |
| Elite II w/controller | 535.00 |
| Elite III | 530.00 |
| Elite III w/controller | 610.00 |
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| **AMDEK** | |
| Color I + | 315.00 |
| Color II + | 440.00 |
| Color III | 350.00 |
| DVM II or DVM III RGB Interface | 139.00 |
| DVM 80E RGB Interface | 149.00 |
| Amdek 300G Hi-Res | 149.00 |
| Amdek 300A Amber | 160.00 |
| **NEC** 12" Color | 299.00 |
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| 12" AMBER | 135.00 |
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| RGB-II Interface | 140.00 |

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| Program | Our Price |
|---|---|
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| Zardax | 150.00 |
| **APPLE** | |
| Appleworks | call |
| Apple Writer IIe | 160.00 |
| Quick File IIe | 80.00 |
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| Jack II | call |
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| Format II Enhanced | 105.00 |
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| Spellstar | 162.00 |
| Wordstar | 320.00 |
| Wordstar W/Z Card | Call |
| Word/Spell/Mail | 540.00 |
| **MICROSOFT** Multiplan | 175.00 |
| **MID WEST SOFTWARE** | |
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| **MUSE** Supertext-Pro | 126.00 |
| **PEACHTREE** Peach Calc | 92.00 |
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| Report Card | 44.00 |
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| Homeword | 48.00 |
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| Visiplot | 139.00 |
| Visitrend/Visiplot | 198.00 |

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|---|---|
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| **BPI** Speed Read | 140.00 |
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| Double Take | 24.00 |
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| Frame Up | 20.00 |
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| Managing Your Money | 127.00 |
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| **EPS** Keyboard | 275.00 |
| **HAYES** Apple II: | |
| Mach II | 31.00 |
| Mach III | 38.95 |
| Apple IIe: | |
| Mach II | 35.00 |
| Mach III | 42.95 |
| **HAYES** | |
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| **KOALA** Koala Pad | 90.00 |
| **KRAFT** Joystick | 40.00 |
| **MCT** Speed Deamon | 225.00 |
| **MICROSOFT** | |
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| Softcard | 238.00 |
| **NOVATION** Apple Cat II | 240.00 |
| **ORANGE MICRO** Grappler + | 120.00 |
| **SATURN** 128K Board | 375.00 |
| **SPIES LABS** | |
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| **SWEET MICRO** | |
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| **SYNETIXS** Super Sprite | 320.00 |
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| Paddles | 28.00 |
| Select A Port | 35.00 |
| **TRACKHOUSE** Key Pad | 150.00 |
| **Thunder Clock +** | 120.00 |
| **VIDEX** | |
| Ultraterm | 295.00 |
| Videoterm | 245.00 |
| **ZOOM TELEFONICS** | |
| Networker | 105.00 |
| Netmaster | 65.00 |
| Combo | 145.00 |

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|---|---|
| **XIDEX** 5¼ SSDD | 23.00 |
| **ELEPHANT** 5 ¼ SSSD | 18.50 |
| **MAXELL** 5 ¼ SSDD | 28.00 |
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- Runs Both Apple Soft and CP/M Software

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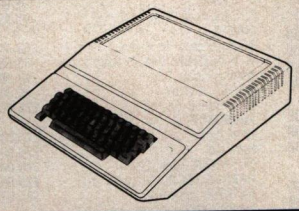

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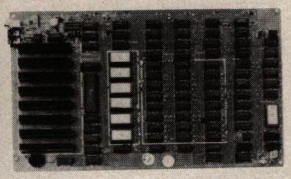
Apple Look Alike
48K User Memory
Supports Upper & Lower Case
100% Apple II* Compatible

**$455.00**



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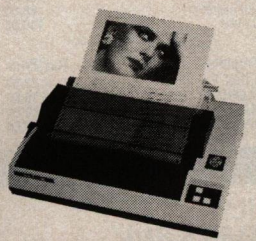

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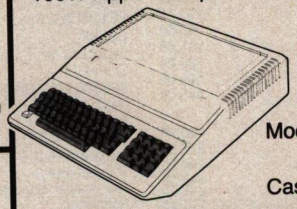

All above models are standard with Numeric Keypad, Function Keys, Auto Repeat Keys, Upper/lower Case Function, Fully Assembled and Tested.

## PERIPHERALS

| | |
|---|---|
| Autoterm 80-Col. w/Softswitch | $99.95 |
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| Buffer for Printer Interface (16-64K) | 85.00 |
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rect, with spaces inserted to fill to the end of each field.

```
 656snowshoes Sno Ball   zl-5   49 25.00 39.95
8889goggles   Jennings           26 10.00 15.99
 199snorkels  Schearshs SNK-4 48 16.54 25.50
 777flippers  Web        flp      67    20.00
32.95
```

Once you have written the data to the foreign file, try reading it into your empty dBASE file, using the SDF clause.

```
. use temp
. append from <filename> SDF
```

Now list or edit some records to see how things came out. Most likely, unless you were very careful, the fields will be a little skewed one way or another. Keep tailoring your program until newly appended records look right and only then restructure your dBASE II database to meet any additional requirements. It's easier in dBASE than in a higher-level language.

Many BASIC files are sequential rather than random in format; their fields are separated by commas, and their character strings (as opposed to numbers) are enclosed in quotes. The commas are called "delimiters" because they tell a program where the limits of each field are. See figure 4 for the Inv-2 file in this format.

To read files such as the one in figure 4 into a dBASE II file, you use the [delimited] option (e.g., Append from <filename> delimited).

Finally, if your foreign file is delimited by some strange letter or punctuation mark, such as a dash, that's OK too (see figure 5).

```
 656,'snowshoes','Sno Ball','zl-5',49, 25.00, 39.95
8889,'goggles','Jennings',',26, 10.00, 15.99
 199,'snorkels;,;Schearshs','SNK-4',48, 16.54, 25.50
 777,'flippers','Web','flp',67, 20.00, 32.95
```

*Figure 4: Comma as delimiter*

```
 656,-snowshoes-,-Sno Ball-,-zl-5-,49, 25.00, 39.95
8889,-goggles-,-Jennings-,- -,26, 10.00, 15.99
 199,-snorkels-,-Schearshs-,-SNK-4-,48, 16.54, 25.50
 777,-flippers-,-Web-,-flp-,67, 20.00, 32.95
```

*Figure 5: Dash as delimiter*


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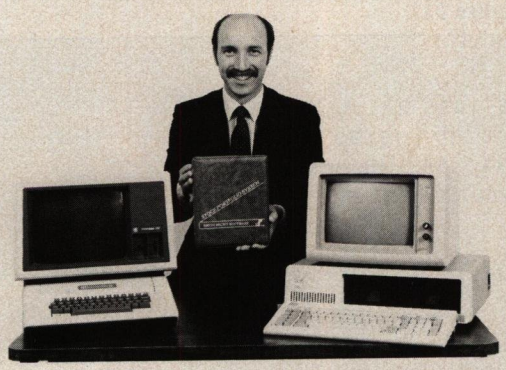

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To append a file such as the one in figure 5, use this command form: Append from <filename> delimited with –.

**Traveling Abroad**

While we are on the subject of moving data to and from dBASE, two other areas come to mind—spreadsheets and word processors. The idea of "data independence" is getting more attention, now that "operating environments" are making themselves felt. Consequently, it behooves software manufacturers to supply utilities that allow a standard format for data transfer, and Ashton-Tate is no exception. As we have seen, transferal of data to other languages is possible, but what about all you spreadsheet and word-processor users?

**Anything that appears on your screen (except editing) goes to a disk text file also, and you can use Set Alternate ON and OFF to control when new material is added to the file. This method is useful for creating documentation about dBASE.**

You can capture dBASE activity in a text file in two ways, one of which you have already used—Copy to <filename> SDF. It creates a file called <filename> with a .txt extension, which you can read into a document, using a word processor. You will probably have to edit it somewhat to separate fields, however. The other way is like this:

```
. set alternate to <filename>
. set alternate on
. (list, display, etc. . . . )
. set alternate off
. quit
```

Anything that appears on your screen (except editing) goes to a disk text file also, and you can use Set Alternate ON and OFF to control when new material is added to the file. This method is useful for creating documentation about dBASE, because you can easily include all screen interactions in your document. In fact, I used this method to create the listings in this article.

Some other programs, such as SuperCalc, include routines for creating SDF files that dBASE can read. In SuperCalc, the Output command with D selects the appropriate routine. Use the Append From <filename> SDF just as with the BASIC file mentioned above to move the data into the desired dBASE II file.

Some of these techniques for data transfer are rather crude and take some experimentation. But then so does using dBASE II. With time it becomes easier, and, besides, the emergence of industry standards will soon eliminate most data-interchange problems anyway.

**Next Time**

In the next issue, we'll focus on simultaneous use of two data files. So until then, keep experimenting—and remember, a backup a day keeps the programmer away! ✚

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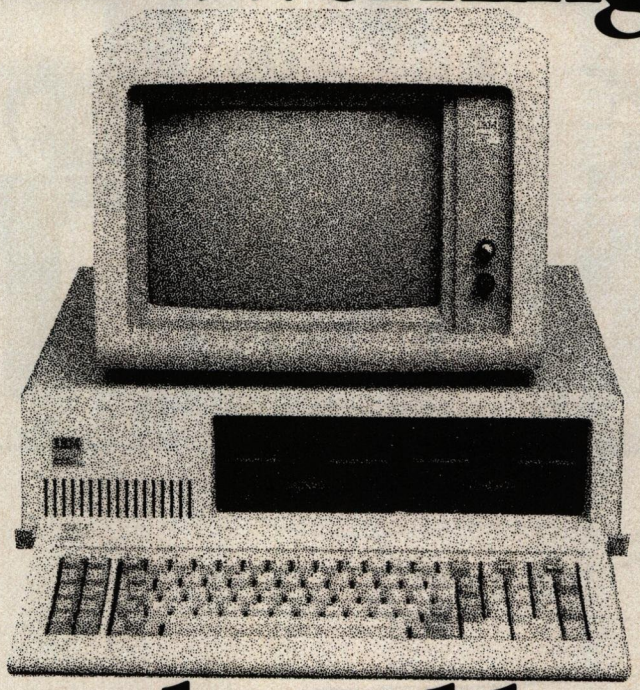

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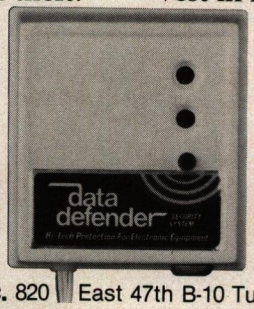


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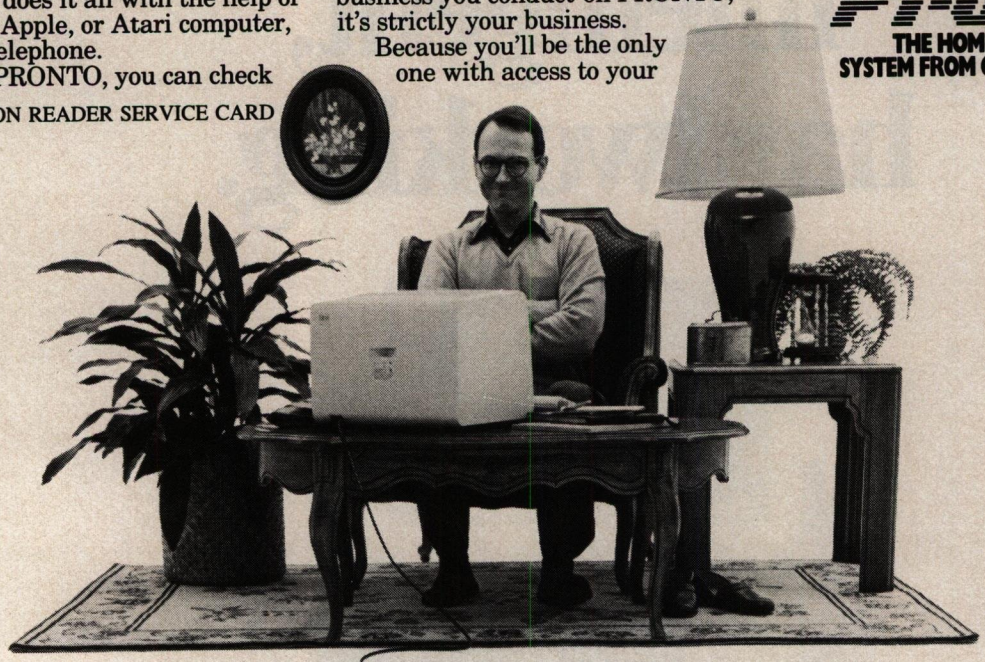

# PRODUCT NEWS

## HARDWARE

### CP/M Gold Card

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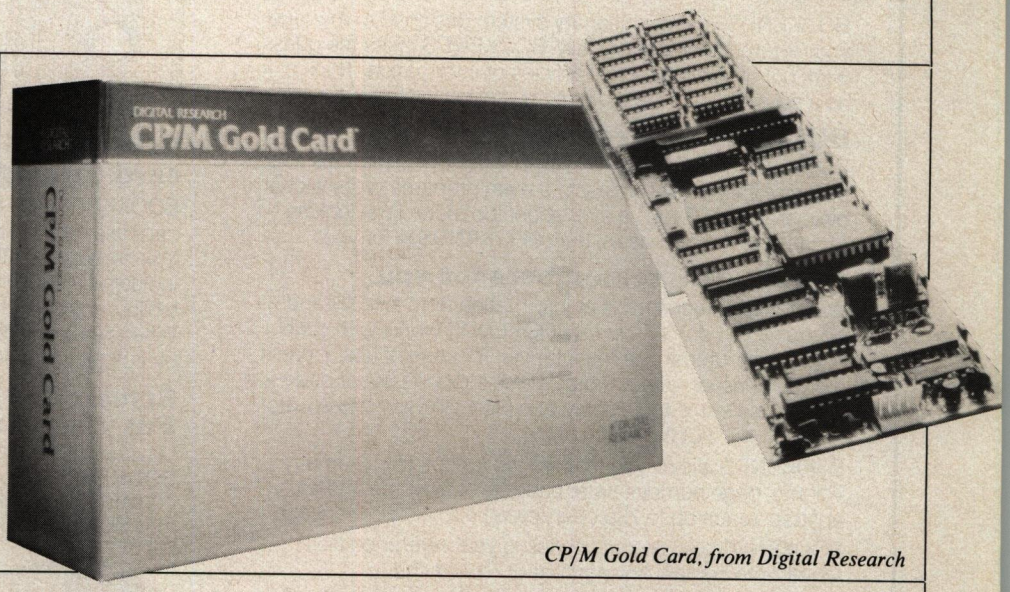
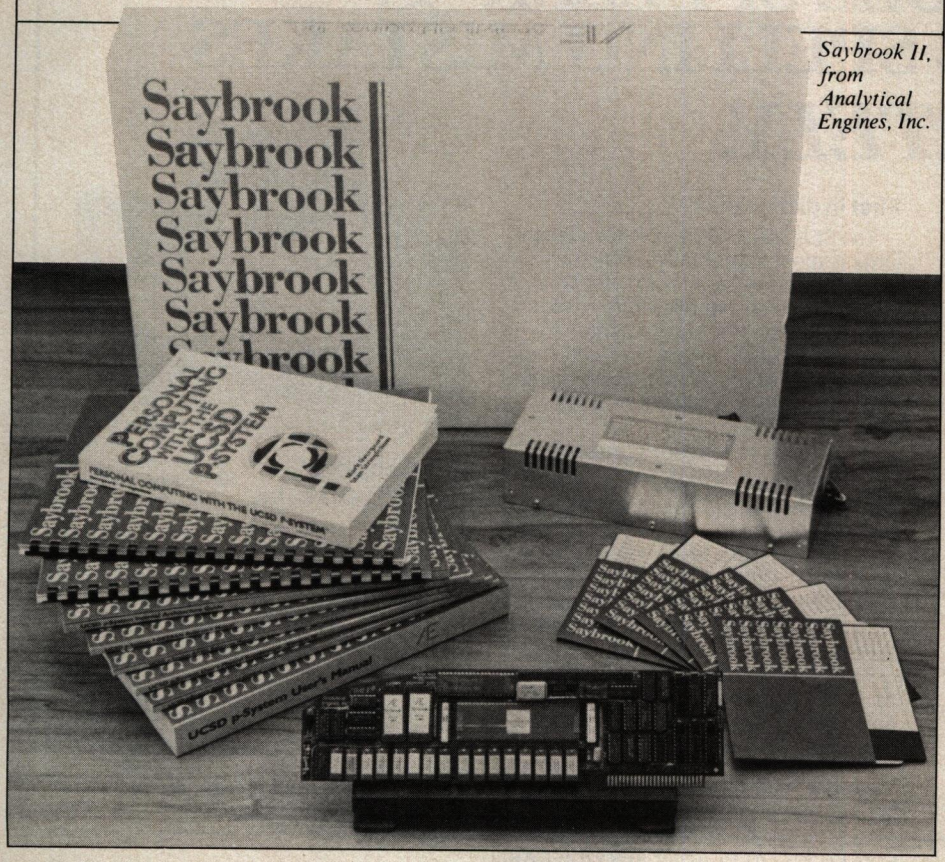



*CP/M Gold Card, from Digital Research*

### Saybrook II

You can purchase the Saybrook II, a 68000 32/16-bit coprocessor, as a Base or an Advanced System. The Base System includes 128K RAM, the UCSD p-System run-time unit Version IV.13, Applesoft-compatible 68000 BASIC, turtle graphics, a 24-hour time-of-day clock, and five programmable timers.




*Saybrook II, from Analytical Engines, Inc.*

The Advanced System includes the Base System, plus a choice of one compiler (Pascal, FORTRAN-77, or BASIC), the EDVANCE screen editor, Saygraphics graphics package, and the Phase-0 cross assembler. *(List Price: Base System $895 [8 MHz], $1195 [12.5 MHz], $1395 [14 MHz]; Advanced System $995 [8 MHz], $1295 [12.5 MHz], $1495 [14 MHz])*

**Requires:** Apple II or IIe

Analytical Engines, Inc.
3415 Greystone, Suite 305
Austin, TX 78731
(512) 346-8430

**CIRCLE 961 ON READER SERVICE CARD**

### DiscMaster II

The DiscMaster II board allows you to connect two 8-inch or two 3½-inch double-density disk drives to your Apple II or Apple-compatible computer.

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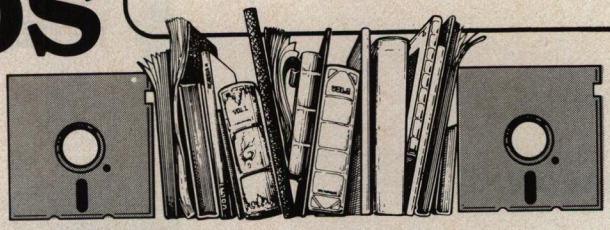

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*April 1983, Softalk magazine reader survey.
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(312) 364-1180

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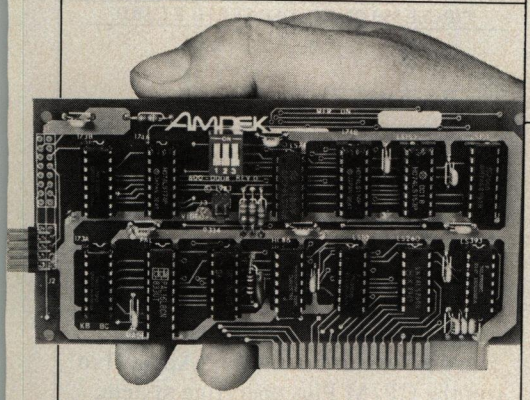


*Amdek's DMV-III, an RGB board for Apple computers*

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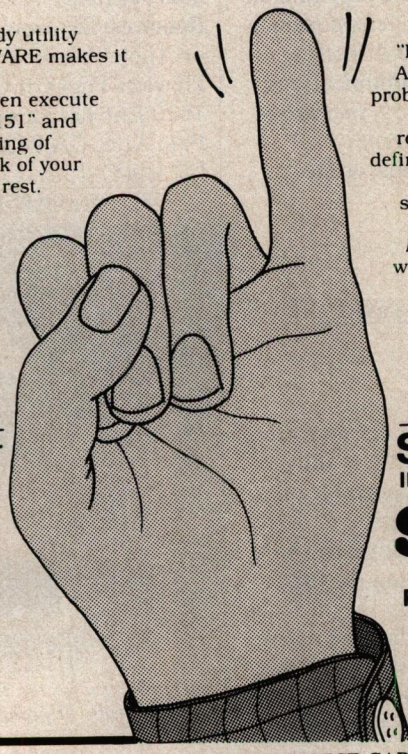

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# PRODUCT NEWS

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Great Plains Software
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Fargo, ND 58109
(701) 281-0550
**CIRCLE 993 ON READER SERVICE CARD**

**The Business Card**
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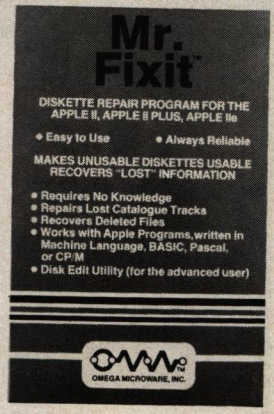


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Also available is the Adalab Chromatography Automation package, which features menu-driven Chromatochart software, together with the Adalab card and the new Chromadapt Chromatography Interface Module. *(List Price: $495, Adalab card; $150, Ada-Amp; $100, Tempsense; $395, Ada-Byte; $250, Lab Data Manager 1; $1645, Adalab Chromatography Automation System)*

**Requires:** Apple II Plus or IIe
Interactive Microware, Inc.
P.O. Box 771
State College, PA 16801
(814) 238-8294

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## SOFTWARE

**Amperware**

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**Requires:** Apple II, II Plus, or IIe
Scientific Software Products, Inc.
5726 Professional Circle, Suite 105
Indianapolis, IN 46241
(317) 299-0467

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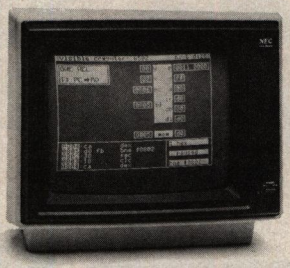

*It's an animated simulation of the 6502 micro processor that lets you see with your own eyes how the 6502 works.*

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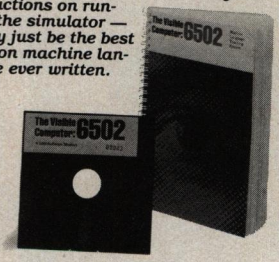


*It's 30 demonstration programs you'll work through with the 6502 simulator.*

**Software Masters™**

For Apple II Plus and IIe. $49.95 from your dealer or direct from Software Masters, 3330 Hillcroft, Suite BB, Houston, Texas, 77057. (713) 266-5771. Bank cards accepted. Mail orders please enclose $3.00 shipping.

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## PRODUCT NEWS

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Day One personal business software enables nonprogrammers to create the software application necessary for nearly any business need, including financial/accounting, sales/marketing, inventory management, list maintenance, and personnel management. The program is available in two versions. The basic package consists of a Teacher Disk, tutorial, documentation manual, and program disks. The advanced package consists of the basic package plus the Day One advanced program suited for experienced users' multifile applications. *(List Price: $495, basic; $695, advanced)*
**Requires:** Apple II, II Plus, or IIe; CP/M card; one disk drive; printer

Day One Software, Inc.
618 Shoemaker Road
King of Prussia, PA 19406
(215) 337-8255
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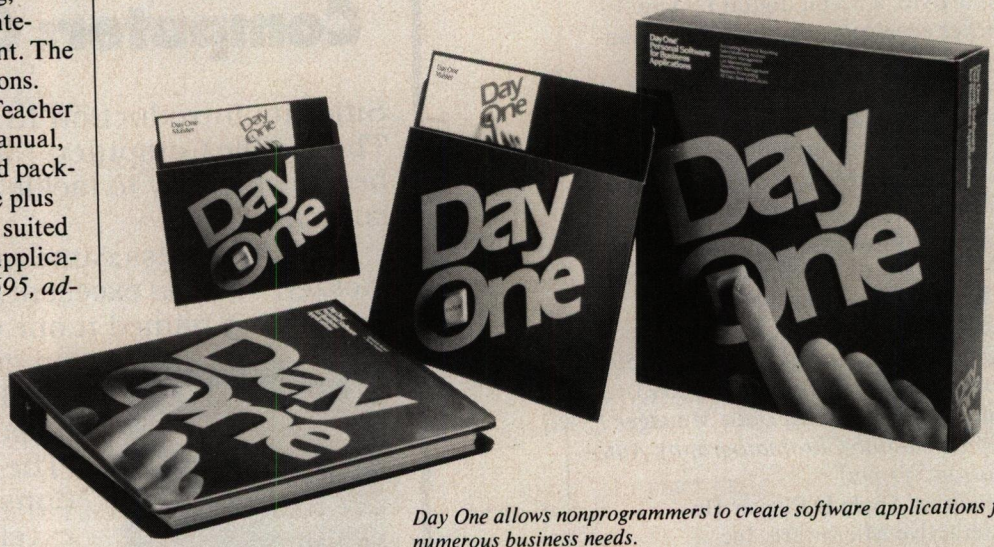


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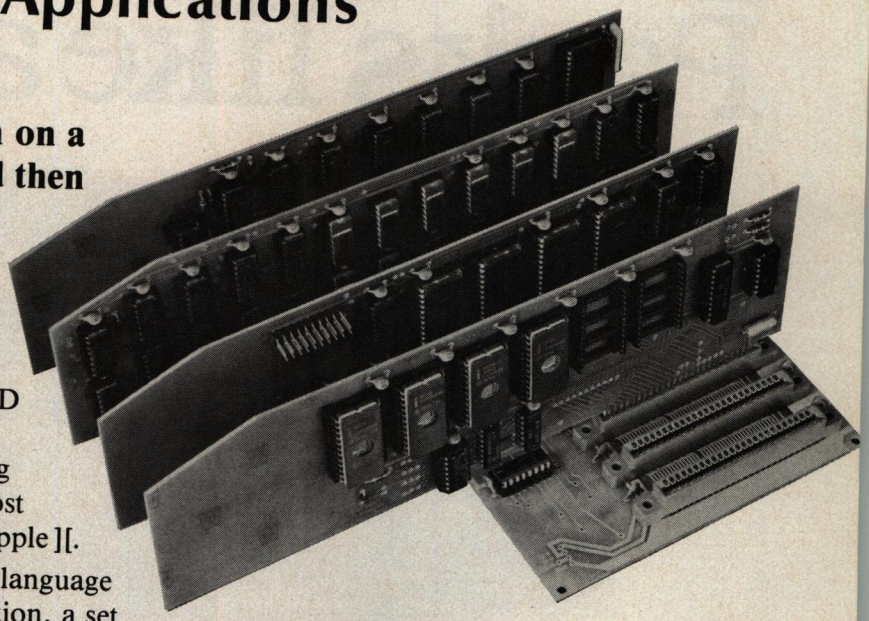

Designed for use in systems where a full Apple computer may not be necessary or desired, the APPLESEED Bus system retains all the essential features of an Apple system, including mother board compatibility with almost every plug-in board available for the Apple ][.

Programs are developed in assembly language on a standard Apple ][. Upon completion, a set of EPROM's are blown and inserted into the APPLESEED Bus system, which then takes control of program execution.

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**TEXT BOARD** The TEXT board is designed to add the conventional TEXT (page 1 and page 2) to an APPLESEED system. The board generates composite video to plug into a standard monitor or T.V. modulator. The board provides 40 columns × 24 rows in each page and is not slot dependent.

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*Please call or write for prices and more detailed information on these and other APPLESEED Bus products.*

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And each GT comes with the exclusive *GT DrivingSystem*™ of software programs.* World-class word processing is a breeze with the *GT Estate WordProcessor.*™ And your dealer will describe the two additional programs that allow GT owners to accelerate their computer driving skills. *Included as standard equipment.

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**Requires:** Apple II, II Plus, IIe, or III in Emulation mode; 48K RAM; Applesoft

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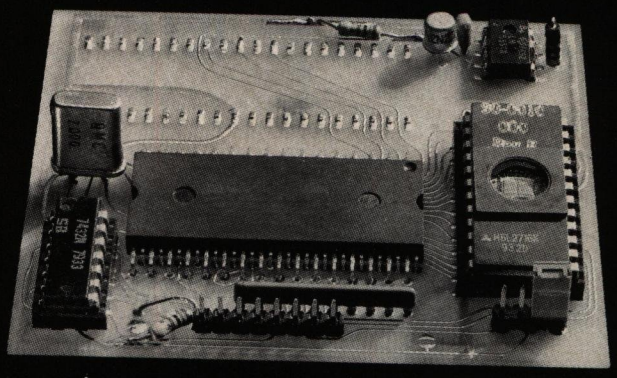

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MicroPro®

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## PRODUCT NEWS

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*Transend, Version 5.0, is an enhanced version of Transend 1,2,3.*

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**Requires:** Apple II, II Plus, IIe, or III in Emulation mode; one disk drive
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(408) 946-7400

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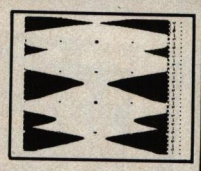

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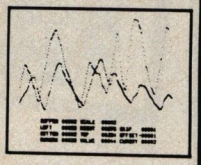

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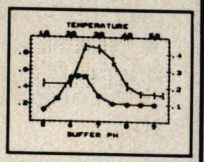


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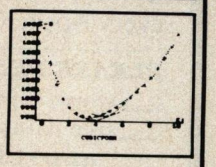

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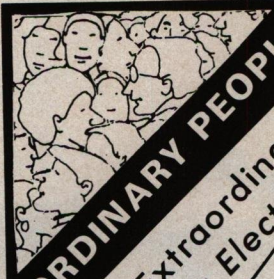

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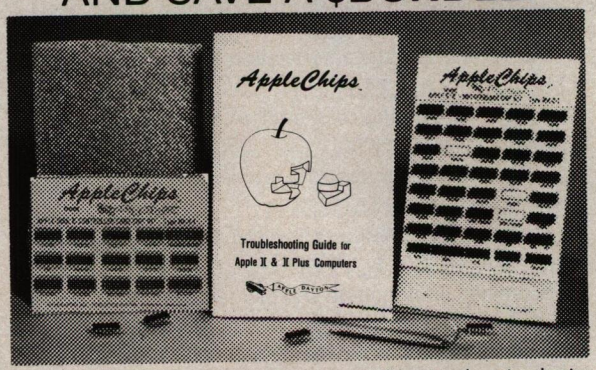


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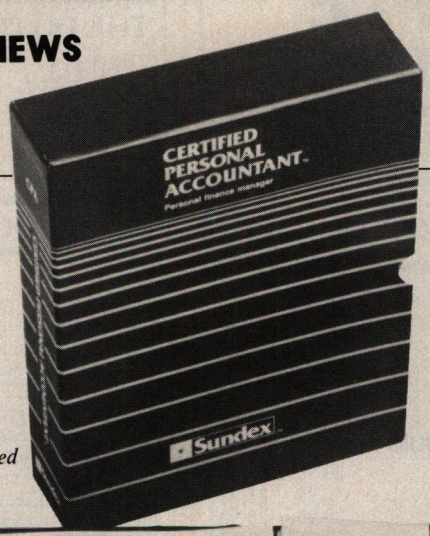


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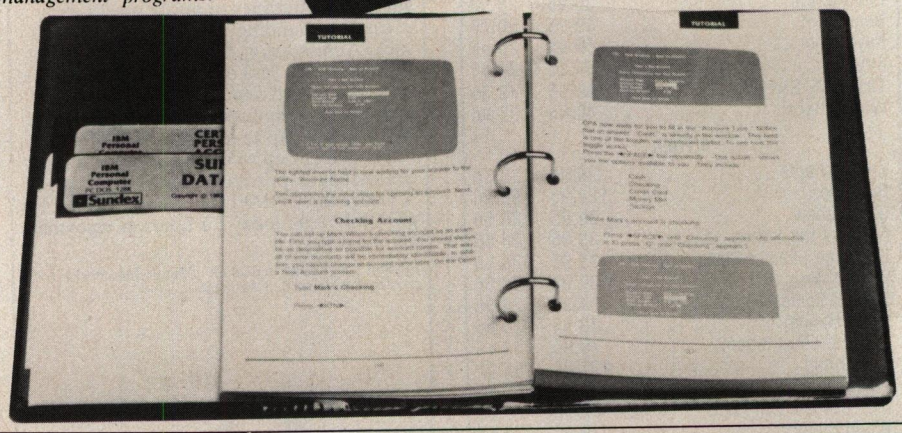



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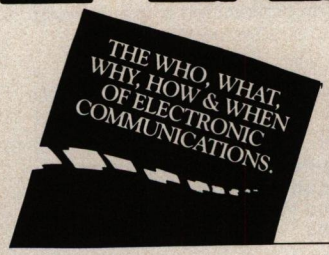


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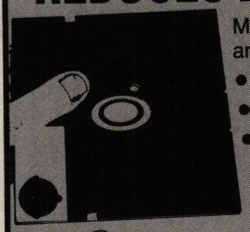

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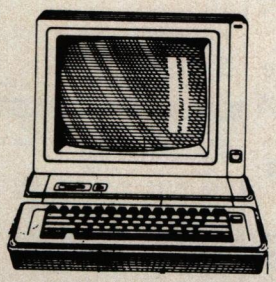

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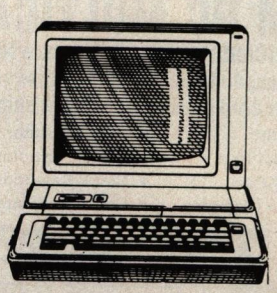

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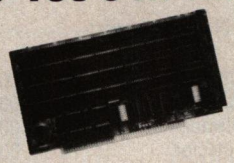

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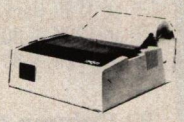

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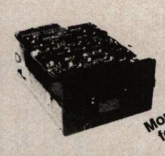

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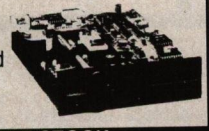

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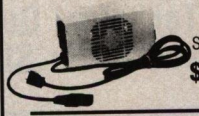

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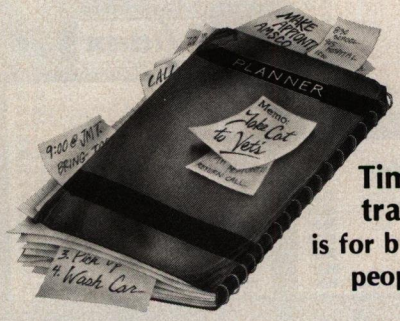


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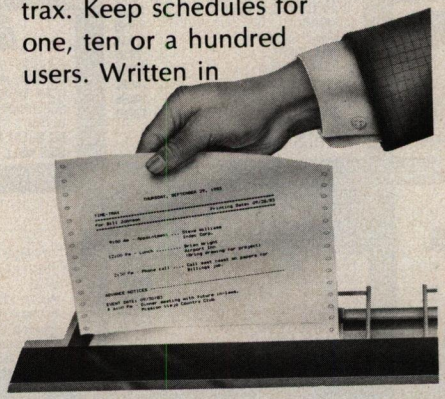

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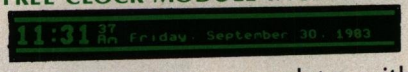


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## PRODUCT NEWS

### MISCELLANEOUS

**Book of Apple Software**
In this comprehensive reference and review guide for Apple II, II Plus, IIe, and III software, independent reviewers describe, evaluate, and rate each program. The reviewers grade the programs on an A-to-F scale as to ease of use, documentation, value for money, and vendor support. The *Book of Apple Software* rates hundreds of programs for business, education, utilities, games, and entertainment, and contains a list of software vendors. (*List Price: $19.95*)
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**Micro-LADS** (grammar), from Laureat Learning Systems, Inc.

**FAY: That Math Woman, FAY: The Word Hunter,** and **FAY: The Word Search Game,** from Didatech Software

**BASIC Building Blocks,** from MECA

**Reader Rabbit and The Fabulous Word Factory, Word Spinner, Number Stumper,** and **Addition Magician,** from The Learning Company

**The Vocabulary Machine,** from South-West EdPsych Services

**Diascriptive Reading I, Read and Solve Math Problems #2,** and **Early Childhood Learning Program,** from Educational Activities, Inc.

**Vocabulary Game** (baseball), **Antonym Game,** and **The Apple Grade Book Version 2.6,** from J&S Software

***BASIC Computer Programs for the Home*** (book and disks), from Hayden Book Co., Inc.

**Jenny of the Prairie, Chelsea of the South Sea Islands, Cave Girl Clair,** and **Lauren of the 25th Century,** from Addison-Wesley

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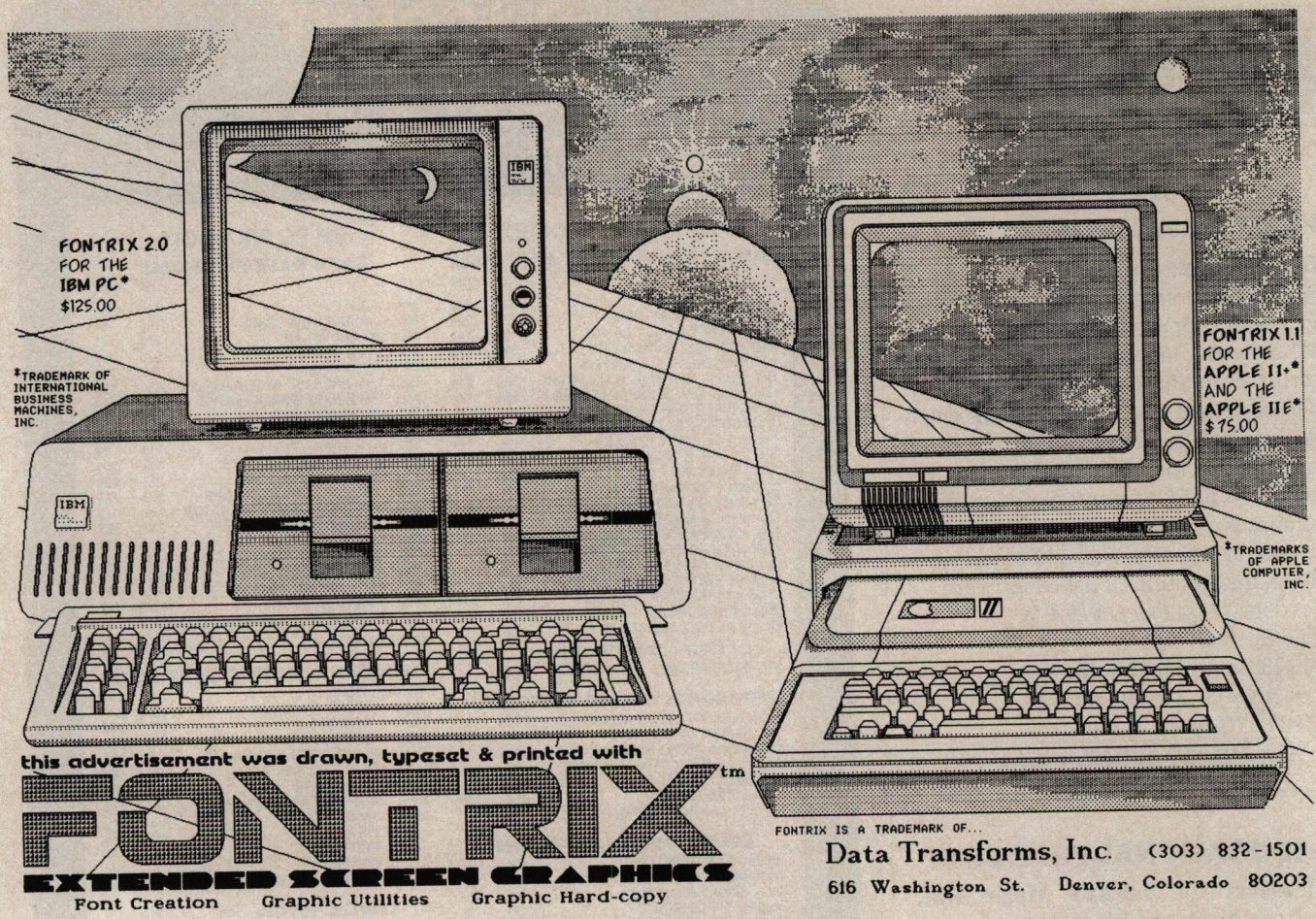


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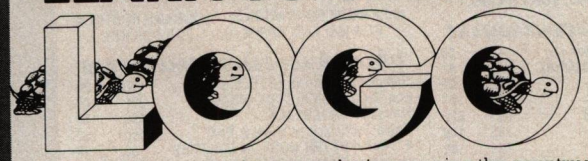


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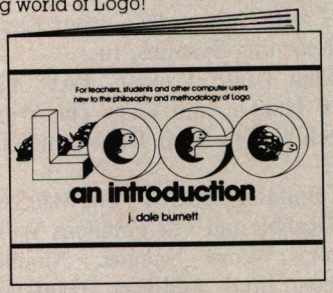


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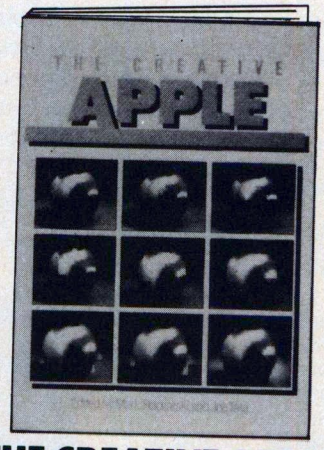


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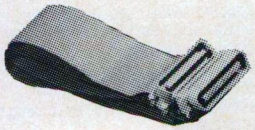

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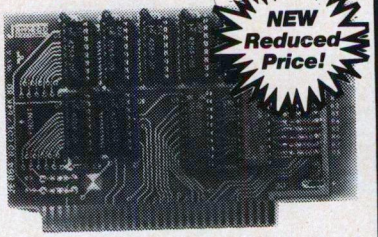

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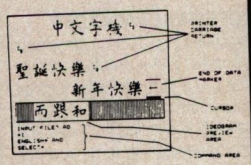

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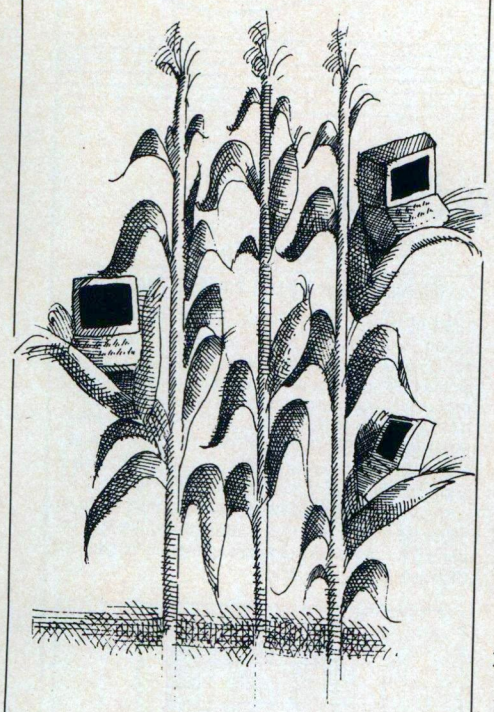

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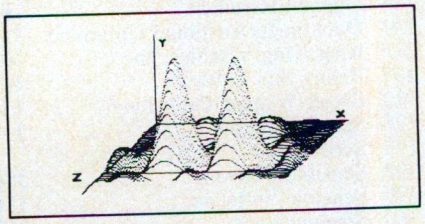


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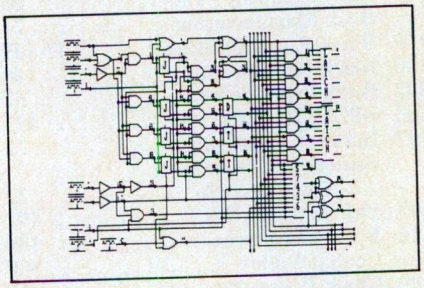

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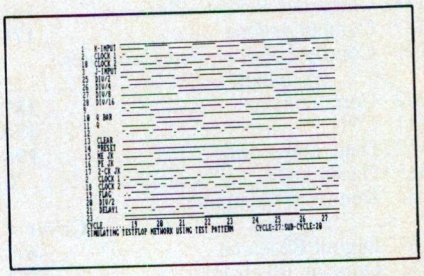

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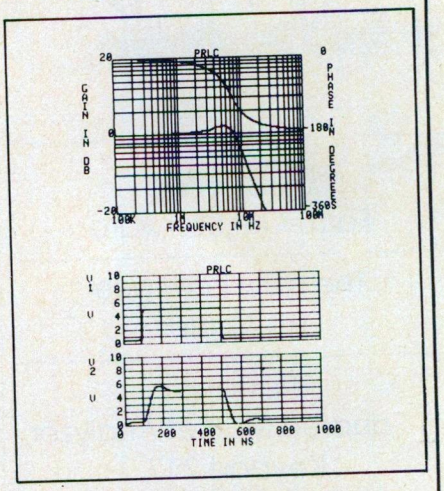


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**1** Please indicate which of the following microcomputers you currently own and/or plan to buy in the next 12 months.

| | Own | Plan to Buy |
|---|---|---|
| Apple II | A | G |
| Apple IIe | B | H |
| Apple III | C | I |
| Lisa | D | J |
| Other (specify) | E | K |
| None | F | L |

**2** For what, if any, business application(s) do you use the microcomputer you currently own?_____

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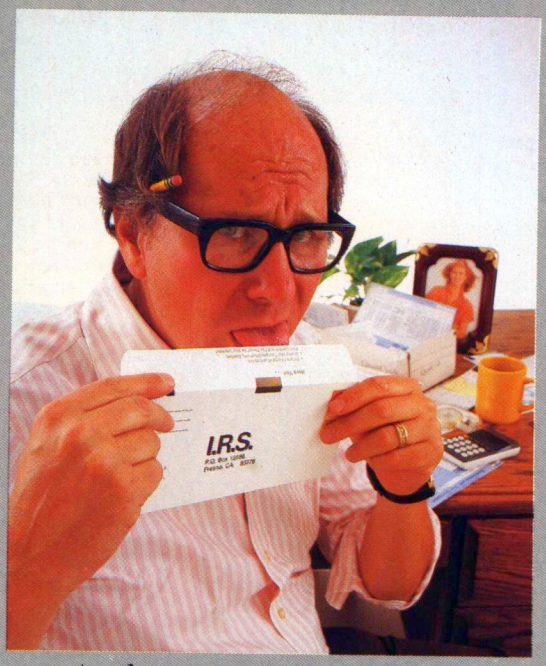


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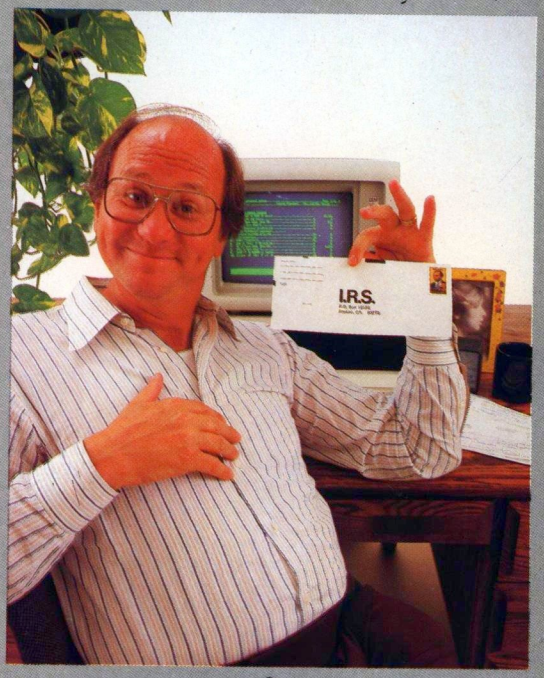


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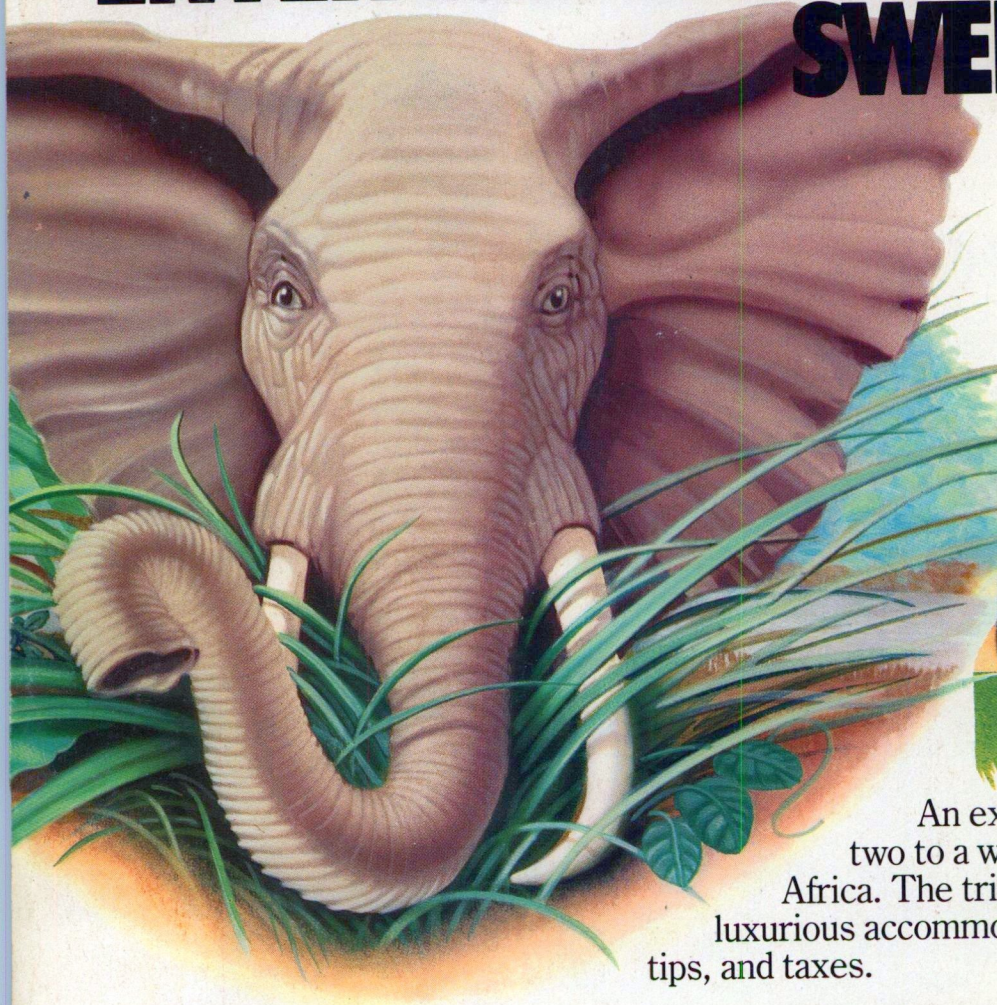

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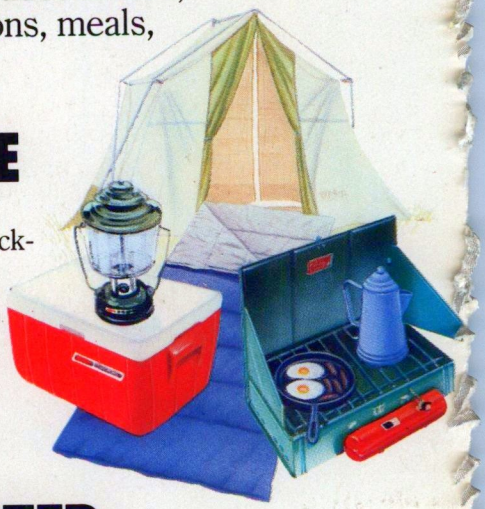

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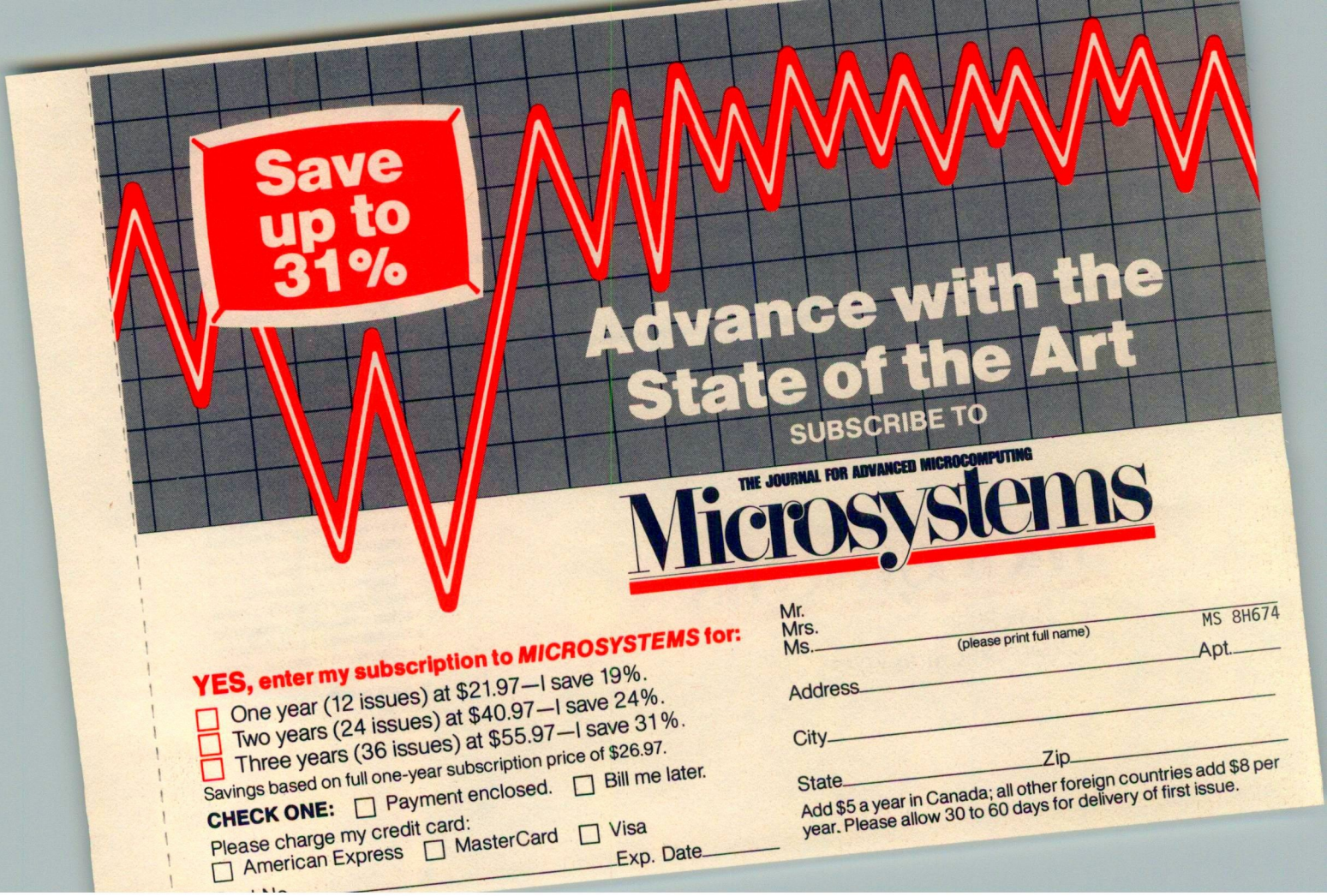


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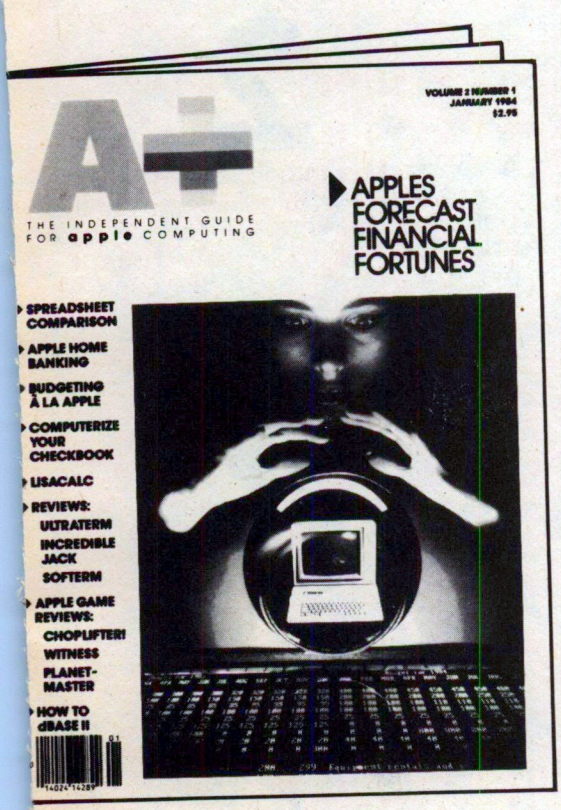


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